ALBUM Nº A-1
AMK-5B autopilot
operating instruction
/2-nd edition/

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Copy No.

AUG-5B AUTOPILOT OPERATING INSTRUCTIONS

(2-sd edition)

Approved For Release 2011/02/07 CIA-RDP82-00038R001400030001

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AFEC-5B AUTOPILOT OPERATING INSTRUCTIONS

(2-nd edition)

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PREFACE

The "AND-5B autopilot Operating Instructions" are intended for the plants, manufacturing "KO" winged missiles, and mechanical personnel of the using organizations.

The "ANK-58 Autopilot Operating Instructions" are the manual for storage, shipment, installation, checks and maintenance of the ANK-58 autopilot within the guaranteed service life.

The main form of storing the ANK-5R autopilot is keeping it in the "KC" winged missile being preserved in accordance with the present instructions EC-05-MK, edition JJI for preservation and extended storage of the "KC" missile in the cepets: for one year since the date of arrival to the point of destination.

The complete autopilot equipment may be installed in the "KC" missile or the H-2 gyro unit may be removed from it; in this case this unit is stored in a special metal tare.

The AFE-5B autopilot is permitted to be stored in the "KC" missile in a hangar for 3 months within the entire guaranteed service life.

The ANA-58 autopilot and its individual units which are not installed in the "EC" missile can be stored in the deplots packed in special metal ture for one year since the rate of arrival to the point of destination.

The ANA-5B autopilet and its individual units can be transported in tare or installed in the "KC" missile.

The requirements for the ATK-58 autopilot shipment are outlined in these instructions. The autopilot installed in the "KC" missile is shipped in accordance with the "KC" winged missile Maintenance and Operating Instructions", Book I.

The autopilot must be installed in and removed from the "KC" missile according to the "KC" winged Missile Maintenance and Operating Instructions" Book ...

The amount and methods of the AUN-AB autopilot checkouts at the "KC" missile manufacturing plant, curing an extended storage and also during the pre-flight test and test before a take-off are given in these Instructions.

SECTIONI

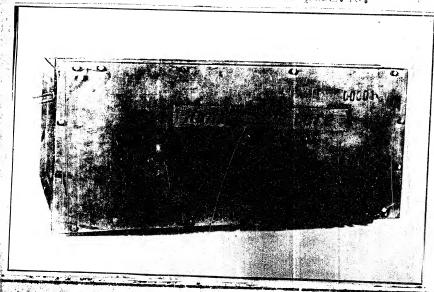
PACKING AND SHIPMENT OF THE AUX-5B AUTOPILOT

1. INSTRUCTIONS FOR PACKING THE AHA-5B AUTOPILOT UNITS IN

1. The tare for the ANN-5B autopilot consists of 2 welded metals cases. Packed in one of the cases are N-1 and No.400.00.000 (for N-4, N-18M) units and units and white and No.400.00.000 (for N-4, N-18M) units and No.400.00.000 (for N-4, N-18M) units and National No.400.00.000 (for N-4, N-18M) units and National Natio

The external view of one of the cases is given in Fig.1.
Furnished with the metal case made according to dwg.No.399.00.
00.000 is the box (dwg.399.01.00.000) with the plug connectors.

2. The rooms in which the AUG-55 autopilots are packed should meet the requirements indicated in parc. 10.



Fuck the II-I control panel and II-2 gyro unto in

install the H-I control panel on the shock nounts of the mounting (1,Fig.2) and secure it by 4 screws with the Cables plug connectors with two sheets of oil [FUT 1760-53]; and herringbone tape and bind the with lines tareads.

Invert the plug connectors in the holders (). Secure the hitles by the tape with the button (4). Fasten the constol papel filter in the clamp (6).

Install the N+2 gyro unit on the shock mounts (?) of the mounting (1, Fig.3) and secure by 3 bolts. Attach the N-2 gyro unit plug connectors No.31, 39, 42 (manufactured bregially for the N-2 gyro units) 43, 45 and 47 to the Flanges (3) using their coupling nuts. Fasten plug connector No.35 to the flange (4) by a coupling nut.

Cover the bent portions of cables ko.39, 42 and 43 with a court chlorvinyl tubes (7, dia. 34) and secure them by the tepe with the button to the mounting.

Secure cables No.31, 35 and 44 by the tage with the button (9), cover them with the split chlorvinyl cube (10) and lasten them to plug connector No.35 by the tage with the button (11). Cover cables No.45 and 47 with the split chlorvinyl tube (12) and taster them to plug connector No.45 by the tage with the button (13, rig.3).

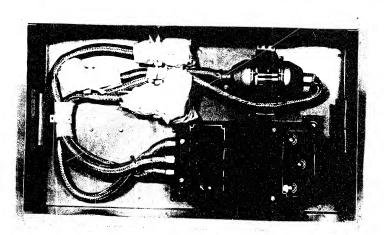
Secure the H-2 gyro unit filter to the mounting with the H-I control panel by means of a clamp and plug connector No.44 by means of its coupling nut _ to the flange located on the same mounting.

chlorvinyl tape.

Move the mountings with the N-I and N-2 units installed along the guide rails into the case placed on the floor; see that the mountings are in the vertical position. The mountings must move along the rails without shaking and sticking. If necessary, bend the guide rails.

Secure cables No.45 and 47 to cable No.44 by the tape with the button (1) and place them in the ben (2, Fig.4) manufactured according to dwg. No.399.04.00.000, with the plug connector mating parks furnished with the autopilot set.

NOTE: The chloryingl tubes may be substituted by



Flg. 2. II-I

Control Panel-to-lounting

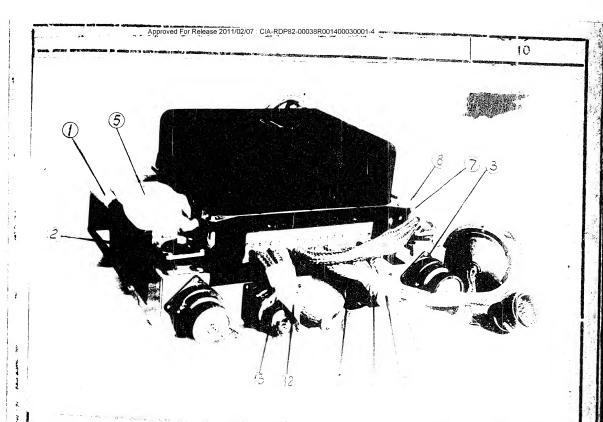


Fig.3. U-C Gyro Unit-to-Mounting Attachment

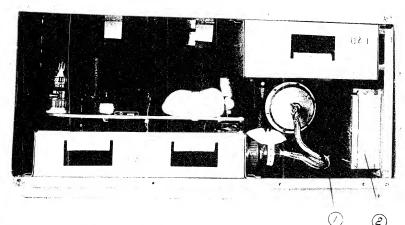


Fig.4. II-I and II-2 Units in Tare

Prior to installation, plute in each sounding or buy
(5, Pig.2 and 3) with "FOLT" silica gel sempora in 100 gra
(TOCT 3956-A7) and in the Hallywo wait mounting a larg
(6, Pig.3) with blue silica gel is indestor, 12-22 gra

Place the silica cal bags so that West composition to during shipment. It is portrived to the same bags to the cables or mounting with the fact good sale or leader through or faster than by tapes with buttons.

- NOTES: 1. Then placing that cags to the econe siling gol dehydrator lamidity and the econe siling
 - 2. The silica gal dehydraviv title love our be substituted by cilica gal type A _OFF (20073096-47).
 - 3. If a cartridge oil siling gold a trainer or is placed in the ones, was but the ones as silica gel indicator should be be put in the case.
 - 4. Then packing the T-2 gaze -max(cannifortures with plug No.42) which is incomparated in the autopilet set installed in the since in the salest place in the salest the cap for two sleve mentioned plug: attack the place of the class of the class of the class.

On accomplishing the packing, Tarmien the care with a packing list of a given stardard, close the cree with the cover, fasten the latter with 16 telts, secure the case with two seals 1053.55 at the corners located obliquely and early with an indeltable black paint the number of the autopilet set on the right upper corner of the cover and top wall of the

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Fig. " Testing the Eastling Otels for eightness.

install the pull serve wasts (1 ca) on the administration (1, Pig. 6) one secure each unit by a belts offer water Court the pull serve units of the secure of (50 to 50) ubricant.

Install the 4-1340 there on the such a water (2) and secure it by A screws with nois.

Frap each plup despects of the Tall serve with a II-ISUMO timer cables with we electe or all report or herring-bone tape and tid the topo with lines threads.

Insert the flut connectors in the helders (3). Pasten the H-4 serve unity to the clarps (4). Scoure the cibles by the tape with the batten (7).

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Tighten the HAT-ICA inverters (2 ea) to the mounting (1, Fig.7) by the sorows with nuts, wrap the end caps and plug connectors of the inverters with two sheets of oil paper (Fig.7) and tie the oil paper with lines threads.

Move the mountings with the F-4 serve units and H-1840 timer and mounting with the HAC-JAA inverters into the case using the paide rails (Fig. 8).

The mounting should move along the guide rails without shaking and sticking.

If necessary, bend the rails. The mountings must be moved into the case placed on the floor in the vertical position.

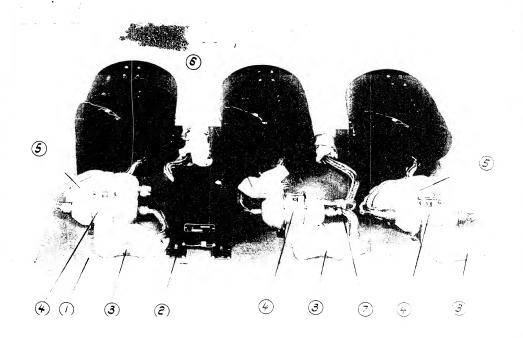


Fig. . N-4 corvo Units and .-1820 Piner to-Counting

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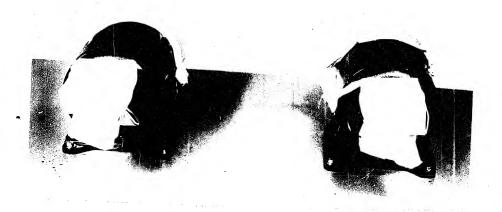


Fig. 7. MAI-IGA Inverter-to-Mounting Attachment

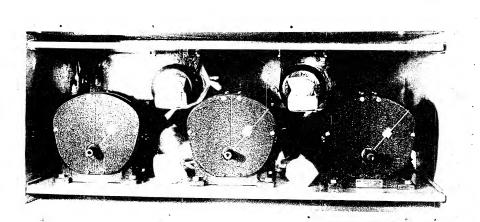


Fig. 8. N-4 Serve Units, H-18MO Timer and HAF-IGA Invertors Installed in Tare.

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Before installing the mountings, place on the mounting with H-4 servo units and H-16MO timer two bags (5) with "KCM" silica gel dehydrator, 200 grm. each and the bag (6) with a blue silica gel - indicator, 15-20 grm. The bags must be placed so that they are not moved during transportation. It is permitted to the bags to the cables with linen threads or secure them by tapes with buttons (Fig. 6).

NOTES: 1. When placing the silica gel dehydrator bags in the tare, silica gel humidity must not exceed 2%.

- 2. The saline gel type "MCM", " In CI" end LTCI".
- 3. If a special cartridge with silion gelindicator is installed in the case, the bag (6) with silica gel-indicator must not be placed in the case.

On accomplishing the pucking, furnish the case with the packing list of a given standard, close the case with the cover, attach the case cover with 14 bolts, secure the case with two seals 1053A55 at two corners located obliquely (Fig.1) and mark with an indelible black paint the number of the autopilot set in the right upper corner of the cover and upper wall of the case.

Test the case welded seems tightness and tightness of the cover in the same way as for the case with H-I and H-2 units (see step 3).

MOTE: ben packing the autopilet in the using organization it is permitted, as a exception, near to feet the silica gel bags in the case and to test the case for mirtightness.

- 2. INSTRUCTIONS FOR PACELIS THE ANK-53 AUTOPILOT UNITS
 IN SHIPPING BOXES
- 1. To transport the AMM-5B autopilet set or its individual units, the metal cases are additionally placed in the wooden shipping boxes manufactured according to dwg. No.464.00.00.000.
- 2. Then packing the autopilot set in the shipping boxes, proceed as follows:

Open the upper cover of the shipping box. Carefully, case without jerks and shocks, place the metal, in the shipping box so that the case position would correspond to the inscriptions made on the case.

Placed between the walls of the shipping box and metal case are plywood and felt spacers to prevent the metal case from shifting inside the wooden box (Fig. 9).

Close the upper cover, secure the box with four iron strips and two seals 1053455.

On accomplishing the packing, mark with an indelible black paint the number of the autorilot set in the right upper corner of the cover.

MOTE: Then packing the T-2 gyro unit incorporated in the autopilot set installed in the "KC" missile, additionally mark on the case cover the number of the "KC" missile in which the T-2 gyro unit is to be installed.





facking Case in a Shipping Box Fig. 9.

3. 利用工具 AUTOPILOT UNPARTING INSTRUCTIONS

1. When unpacking the shipping boxes, proceed as follows: .

Chuck for presence of seals on the box. Pamove the iron strips and upper cover of the satpping box.

Take out the plywood and felt spacers placed between the wooder ber one metal case. Carefully remove the metal case from the wooden box so that the motal came position would correspond to the inscriptions made on the case.

2. Ungack the packing cases with the H-I units as follows:

Check the case for treedom damages and for presence of seals.

Break the seals and unscrew 14 bolts attaching the side.

Make sure that the packing list is furnished. Check for presence of units and their numbers according to the packing and completing lists.

Inspect the silica gel-indicator. If the silica gel-indicator has become pink, replace the silica gel-indicator and silica gel dehydrator before a repeated packing.

NOTE: The autopilot units stored in the cases with pink silica gel-indicator should not be subjected to special checks; the units serviceability is determined during the next periodic check.

. Remove the tape with the button securing cables 1.0.45 and 47 to cable No.44.

Simultaneously take the mountingswith the N-I and N-2 units out of the case so that the units would be in the horizontal position.

the flange located on the counting with the H-I unit and release the H-2 gyro unit filter from the clamp located on the same mounting.

Remove the tapes with the buttons, securing the cables and unscrew the remaining plug connectors of the 11-2 gyro unit from the mounting flanges.

Remove the silica sel bags.

Unscrew 3 bolts and remove the Li-T gyro with from the shock-mounts of the mounting. Nove the mounting in the case along the guide rails. Unscrew the screw of the clamp, release the U-T control panel filter and take out the U-T

Remove the harringbone tape and oil paper from the plus connectors.

Unscrew four screws and remove the H-T control panel from the mounting shock-mounts. Move the mounting in the case along the guide rails.

Attach the side wall by 2 bolts and place the remaining 12 bolts inside the case.

3. Unpack the cases with the H-4 servo units, II-18MC timer and HAT-12A inverters as follows:

Check the case for freedom from damages and for presence of seals.

break the sears and unsorew 14 bolts attaching the side wall. Make sure, that the proking list is furnished. Check the units and their numbers according to the packing and completing lists. Inspect the silica gel indicator if the silica gel has become pink, replace the silica gel-indicator and cilica gel-dehydrator before a repeated packing.

<u>MOTE</u>: The autopilot units, stored in the coses with a pink silien gel, should not be subjected to special checks; the units serviceability is described.

during the next periodic check.

Remove the nounting with the 11-4 serve unit and 11-12.0 timer so that the units would be in the horizontal position. Remove the silica gel bags.

Unsorew the screws of the clamps, release the left serve unit filters and take out the H-4 serve unit play connectors from the holders.

Remove the tapes with buttons which secure the cables. Cut the threads, remove the herringhone tape and oil paper from the plug connectors.

Unscrew four screws and remove the N-ISEO timer from the shock-mounts. Unscrew 4 bolts and remove the N-4 servo units from the mounting. Move the mounting into the case along the guide rails.

Take the mounting with the HAT-TOA inverters out of the case. Cut the threads and remove oil paper from the end caps and plug connectors of the inverters. Unserew & screws and remove the inverters from the mounting. Move the mounting into the case along the rails.

Attach the side wall by 2 bolts and place the remaining 12 bolts inside the case.

4. ANKESB AUTOFILOT SHIPMENT

- 1. The ATK-5B. autopilot and its individual units which are not installed in the "KC" winged missile must be shipped in a box according to the requirements indicated in par. 1 and 2, these Instructions.
- 2. When carrying, loading and shipping the boxes see that the position of the boxes corresponds to the inscriptions made on them. The boxes must be carefully carried and loaded without jerks and shocks.

When shipping, install and attach the boxes so as to protect them from falls, displacement and impacts against each other. Do not transport the autopilot and its individual units

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- 7. The attachment parts must ensure secure attachment of the autopilot units in the missile through out the entire service life. The autopilot units attachment parts and plug connectors must be securely looker.
 - 8. Install and remove the autopilot waits only the the electrical system de-crongizes.
 - 9. The requirements for the annopilet for a recommendation in and removal from the bisoide are gaven to the "AD" Togad Missile Defricance and operating transcriptions for the togad.
 - 6. SERVERTES On ZERS ON THE PROPERTY OF THE CALL AND ALL AND A
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- In the Making possible.
- Thereof a supply of the control of t

"WINDINGS SELECTOR SWITCH" - in the "O" position and "S.GNAL" selector switch-in the "60MA" position. "O" are "S.GNAL" back in the "O" position.

4. Switch on the "FREEBACK" and transportation.

The H-4 servo unit outlet short should nove to the zero most tion. Attach the HHA-5 simulator pointer to the mules staff, aligning the pointer with the scale zero division. New tips "POWER" switch in the "OFF" position.

Manually turn the serve unit outlet that in any circutante the stop. Switch on the 'POWER' switch, in this case the II-4 serve unit outlet shaft must move to the zero position to within ±0.25°; self-oscillations should not oppear. Rejeat the check with the serve unit outlet shaft turned in the opposite direction.

5. Set the "FEEDBACK" switch in the "OFF" position, the "WINDING SEIECTOR SWITCH" — in the "I" position and the "SIGNAL" selector switch—in the "Jma" position (for the GI-) control panels, whose "SIGNAL" milliammeter has the scales of "3-0.3ma", "60-0-70ma"). Smoothly turn the "SIGNAL" knob to the right, increase the control signal till the servo unit outlet shaft starts steadily rotating and moves to the limit switch (turning through an angle of 10-110 from the zero writion).

The control signal value (in ma) is the unit sensitivity.

When using the KH-I control panel whose "SIGNAL" milliammeter has the scales of "I-O-1mA", "1.5-O-1.5 mA", "2.5-O-1.5mA" and "60-O-60mA", check as described above except for the position of the "SIGNAL" selector switch which must be set before the chack in the "Ma" position. If, when turning the "SIGNAL" knob, the

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Set the "PANEL" selector switch in the "e" position, "WINDINGS SELECTOR SWITCH" - in the "e" position and "Lieball" selector switch-in the "GDNA" position. Set the Lieball' med in the "O" position.

4. Switch or the THE LIMIT was independent form.

The H-4 servo unit cutlet short short tree to warr out.

tion. Attach the H-6 surulated published to select short, aligning the relation of the market process.

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"OTTO Penels, who will be right, increased the right, increased the shart starts are the functional through an again the control start value.

has the scales of the -transport of the "60-0-60ma", check as described the character for the "SIGNAL" selector owitch which must be set before the chack in the "1mA" position. If, when turning the "AIGNAL" knot, the

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Set the "FAMSL" selector switch in the "Desiding, "WINDINGS JELECTOR SWITCH" - is the "De lost an and Elegan's selector switch in the "Gord" cosision. You are trivial when in the "O" position.

4. Switch or the MINICELLY and Indian Them.

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4. Switch or the Carlon and Transfer to the Show. The H-A serve drift patient and a serve drift patient and a serve drift patient and a serve drift and a serve and a serve drift and a serve and a serve drift and a serve an

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control signal value, at which the shelt starts rotating, exceeds 1mA, it is necessary to set the "SITM.A" selector switch in the "1.5m." position and if tress values are exceeded, set the selector switch in the "2.5m." position.

Repeat checking with the "NIMBAN" knob to see to the left.

The serve unit outlet shart chould move to the apposite

limit switch.

then senting an ourse and interpretation of the positions of a first continuous for a sensitivity with the table continuous for the first continuo

5. Outing the life will be with a second of the second of

the "BIONAL" best to the above it latter to a second secon

Repeat the circle that we say the should be some circle ty. Set the block set in the set in the set of the set

cuber last the state of the sta

Check the light of the sign of a

ontrol page to the "Copposition and a second second



Connect supply of 26 7 and, to the control panel.

Connect the control panel cable to the plug connector of one.

of the NAI-IPA inverters.

9. Switch on the "POWAR" and "JOAF" switches.
The gyro motors installed in the control panel must start
rotating. After F min. sheek by the control panel F.C. ammeter
the current drawn by the invirter which under normal conditions
must not expeed 3.9 A.

Then checking the autopilot at a temperature different from the normal temperature within a range of -35°C to $+50^{\circ}\text{C}$, increase the above mentioned telerance by 0.06% for each 10°C of the temperature change either side from normal.

10. Set who "Phace METSOTOR SUFFICH" in the "I" position.

Check A.C. voltage generated by the inverter using the control panel A.C. voltage and the alternating current generated by the inverter using the control panel ... ammeter. Under normal conditions voltage should be equal to 36+4 V and current should not exceed 3.5 1 A.

When checking at a temperature different from the normal temperature within a range of -35° to $+50^\circ$ C, increase the 4 V tolerance of the voltageor regaings by 3.2 V for every 10° C of the temperature change either side from normal.

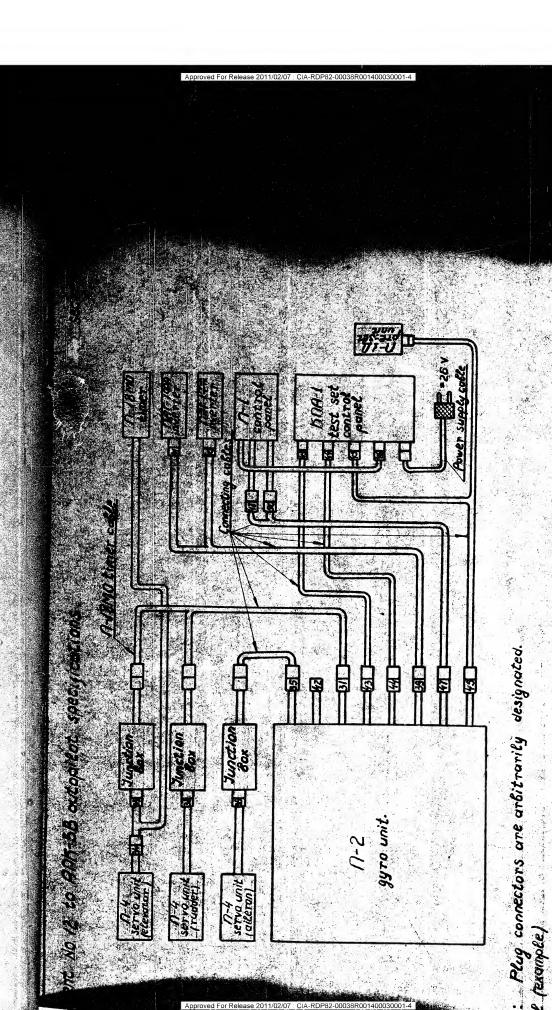
In the temperature range indicated below and other similar conditions the telerance for the ampeter, must be increased:

at #=+20 to -3500 b. 0.451 A

at T=+20 to +50°C by 0.012 6.

Set the "PHASE SPEECES AND IN the "2" and "3" positions and check voltage and current in two other phases of the inverter.

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- plug connector No. 35.

^ 92= - ⊆ Power supply colle 77-18MO timer Inverter 0-1 control Merter test set KNA-1 onnecting calle N-18MO timer calle ent No. 12 to ANK-58 outopilot specifications (3) Junction Junction Junction Box gyro unit. 11-2 Servo unit (rudder) 0-4 servo unit (aileran)

Note: Plug connectors are arbitrarily designated.

- plug connector No.35.

Attach the KHA-3 simulator pointers to the H-4 servo unit outlet shafts and set the cinters at zero points on the simulator scales.

- NOTES: a) Before energizing the autopilet, check the "CENTALING" potentioneter wipers position on the [1] control punch: he this case the slot on the potentiometer shart must be against the index on the punch cover.
 - b) After illumination of the "plant 52.0" warring lights but not earlier town 2 min. after power is applied, set the selector switch on the Tang panel in the "Hight" position. Jet the "PRI-d ? Bala knob of the Hi-/, panel in the flog. "Us" (osition, the milliumnover printer on and II-, panel must restated "Web, approx. one division. Press the "bld GING" button on the lillA-I control ; n.1, the NEIGHT warning light must go out and the "GREAT or warning light sust come on, the elevator simulator pointer must nerlant 10+21' to the left. Furt the "INE-SEE UNITY knob of the SI-II penel in turn to the left our to the right. The pointers of the elevator simul ter and millimmeter on the HI-Larnel must be mericuless. Let the Trib-Taki ibil" and on vac M-A panel in the zero posicion and chargo the selector switch from the "Line" position to the middle pesition.

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- ine off poser supply on the .de-j octavel punch the .de-f 5-10 ces. navrated the Lougillat .gain. Leit, will the "Mint .light varuing light comes on.
- e) attended "Date " Date | Butter | Date is like inuser, repuds the show acompain a sign of the sta-- 1 6 cars their our resulting garage not in early . At 12 List Constituent. In this case has significal autilities ai thate car ear of a situal grow of the reduce of light the bod pre-post est to be built with the areas successes. On prolifer week a servit make ke to this down is the 10, and the first of the state of the At the wasting material was The less many three man and the and suffices circulater aust des. It is no seek might that wingers imor the
- TIME. It is a majoring the first panel pre-set with the last of to the right in the frage of the panel of the

Serva mri Adiata anti-

2. The moral colding grow to the A.-17%

TO THE PERSON

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- ine and year apply on the A.A-)

 control place the acception gain. Sait,

 that the <u>Claims of the varying light</u>

 cause on.
- - The most usual legace but down in the 10, 20, 20, 20, 20 and 60 positions, in it will not use the legace to the legace and the legace to the legace and the legace to the legace and the legace and legace an
- ingle of the contains the W-A punel pre-set will a six or the right in the years of the 20, the BASES RIPS warning light cay remain illuvinated.
 - 3. Such switching over to the An-17E

insulator, the direction indicator on the limbourer is imperative.

the differ too 'Reseables' warning kights come on(but not contact them a win. Asker power to supplied) set the "1900-28 TalkTTTT believed on the control panel in the "BOARD TRICK" and switch on the builder switch.

The "BOAND CHACKS and "CANCE" varying lights must come on scarply well to the N-1 gard unit in direction; at the anstant of targeng the N-2 gard unit, the N-4 rudger near that subject about must turn, appear the shock when working the Led unit in the appearance direction.

Further similar backs when turning the fly gran unit is a the and that .

the function of the life sorre unit should retailed to stand the Carlo No.1. The standard of the control will our justice increasors, when the life gyro unit is turned in the sin stand indicate in Jable No.1, must now to he loui.

Tabla No.1.

Charmel	ligraciaen on	tetion				
MANY regions were worder traper to the property to the control of the cont	11:17 1071	1 70 de 2 5-2 volument	Serve unit	5-4211eron servo unit		
Dixmotion	to the right	counter- olockwise		The state of the s		
Mitteh	uji	-	olockwise			
Roll	to the right		The state of the s	clockwise		

Math: Alter the Magero unit is stopped, the M-4 servo unit outlet enalts must return to the zero position to within 40.25°.

15. Fully turn the "AUDING" knob on the central panel to the "RIGHT". The I-4 rudger serve unit outlet shaft must smoothly, without joins, turn clockwise and the (-) afteron serve unit outlet must - counterclockwise. Fully turn the "PUDDER" know to the "Mart". The (-) rudger serve unit outlet shaft must smoothly, without jorks, turn counterclockwise and the I-1 afteron serve unit outlet shaft - alsokwise. Set the "TUDDER" know is the vere position.

Tully burn the "<u>Min'V ITC.</u>" knob on the control panel to the "UP" position.

The 1-6 Cleviter serve unit outlet shaft rust smoothly, without jerks, turn semicerblockwise. Fully turn the "MAYATON" knob is the "100k" position. The R-4 elevator serve unit shaft must smoothly, eliment jerks, wire clockwise. Bet the "MANYATON" knot in the zero position and the "Chilk" switch in the "JIV" position. But till the 1-1 serve units outlet shafts move to the zero position and "MANYATANO" warning lights come on.

SINULATOR" position. The "__EL-TYG__GLUDEAFOR" warning light must become illuminated. Press the "UECNCING" button on the control p nel and simultaneously start the stor-vaton; in this case the "CACLI" warning light must so out and "MACACYL" werning light must come on. 2-1 sec. after the "UCACIDG" button is pressed, the U-4 clouder servo unit outlet shaft must turn counterclockwise through as angle of 9-9.5° and 40-42 sec. after the button is pressed, the outlet shaft must return to the aero position to within ±0.55°. Perform the check twice, then uncaging for the first time, check the U-4 servo

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power of 28.6 v 1.C. to the central panel. Set the "PANEL" selector switch in the N-4 position, the "WINDING SELECTOR BWITCH" - in the "Gomes" position and the "SIGNAL" knob in the witch - in the "Come" position. Set the "SIGNAL" knob in the "WO") position.

3. Switch on the "PUBLIR" and "FEBLRACK" switches, in this case the Ham alleren servo unit shaft must turn to the zero position.

Check the ilerons position. If the atlerons are deflected from the neutral position (i.e. the allerons neutral position does not correspond to the zero position of the U-4 servo unit) set the allerons in the neutral position by changing the rous length using the adjustment elements.

- 4. bet the "FALUDACK" switch in the "OFF" position and "TINIUSCO DEBECTOR SAUTHY in the "I" resition. Slowly rotating the "DICHAL" potentiometer knob, first in one and the then injother side of zero position, determine the allerons maximum angle of deriection (till the 11-4 serve unit limit switches are actuated) which must be within ±9.5 to 11.50 from the neutral position.
- 5. But the "BIGNAL" knob in the "O" position, switch on the "PLADBICK" switch and check that the ailerons are set in the neutral position again; in this case permissible angle of the ailerons reflection from the neutral position is up to 0.25°.
- 6. Set the "FOWER" switch in the "GEF" position and manually deflect the allerons in either side to the stop; then switch on the "FOWER" switch, in this case the allerons

must move to the deutral position and sell-neggiber of

Repeat the check with the allerons deflected to the opposite side, Set the "POWER" switch in the "OFF" position and disconnect the Π_{-4} alleron serve unit plug connector from the control panel.

7. Check the Π -4 rudder and elevator servo units for proper installation (steps 2-6).

NOTE: The elevator neutral position is the deflection; through 2.5-3° up from the geometric neutral position. Further, this position of the elevator is called "ZERO" position.

- *8. TESTING THE ARE-53 AUTOFILOT AFTER INSTALLATION IN THE "KC" MISSILE
- 1. To check the ATK-5B autopilot after installing it in the "KC" missile, remove the H-2 gyro unit from the missile irrespective of the preservation to which the given "KC" missile will be subjected after it is accepted by the distance.
- 2. Install the N-2 gyro unit on the CNA-5 turn table according to the instructions given in step 12, par.6.
 - NOTE: It is permitted to install the H-2 gyro unit on the HHA-5 turn table without removing the gyro unit from the mounting.
- 3. Place the II-2 gyro unit secured to the turn table at a distance of 1-2.5 m. from the access door in the fusela, bottom section between frames 14 and 18.

NOTE: When installing the turn table see that it does no slide on the base.

- 4. Connect the IL2 gyro unit plug connectors observing the numbers on the plug Connectors and the autopilot wiring diagram (Fig. 11), in this case:
- a) connect the N-2 gyro unit receptacles No.31, 35,39,43 and 47 to the mating plugs of the missile wiring system through the connecting cables;
- b) connect the II-2 gyro unit receptacle No.44 to the mating plug of the MIA-I control panel through the connecting cable; the MIA-I control panel plug connector No.43 through the connecting cable to plug connector No.36 used for gheoking the autopilot installed in the missile and the MIA-I show that the unit plug connector No.45 to the MIA-I show MIA-I control punels through the connecting cable according to the block clagram given in Fig. 10.
 - NOTES: 1. Fo not connect play connectors the attention energized.
 - 2. Connect the automination the missile content of chargings.

 all system to check it could after the missile wire in a system is approved to the whole a line of the charge in the county of the coun

then checking the distoplish program of the program of the control of the control

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Evelopic Switch on the "Edula" switch on the state of the control of the state of the control of the state of the scales are notified threather. It is scaled withing light ones are notified threather.

"Bases with the samples the constant of the state of the

The rudder and ailerons must be set in the neutral posttions to within ±0.5° and the elevator must be set 2.5-3°. Up from the geometric neutral position (further, this position of the elevator is called a "ZERO" position). The control surfaces position indicators pointers must be in the middle positions.

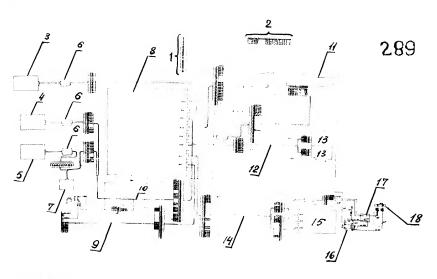
a) After the "BASES ZERO" warning lights become illuminated, but not earlier than 3 min. after power is supplied, set the "B" selector switch on the MI-A control panel in the "TO THE BIGHT" position. Set the pre-set unit knob on the HI-A control panel in the position 4 divisions down. The pointer of the milliammeter on the HI-Apanel must deflect down approx. 4 divisions. The "BASES ZERO" warning light on the KHA-I control panel must go out. Press the "UNCAGING" button: the elevator must move through an angle of 40+1024 down from the initial position.

Turn the pre-set unit knob on the MI-A control panel. "UP", "DOWN" and then set it in the zero position.

The elevator must be motionless. Set the selector switch on the III-L control panel in the middle position.

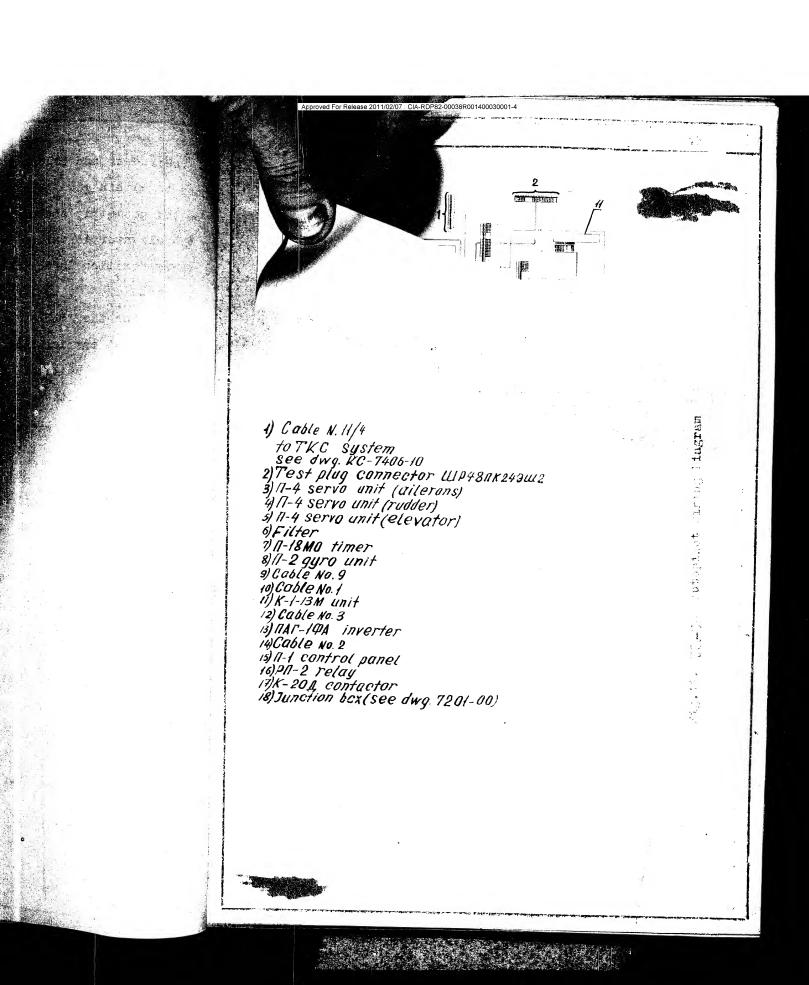
Do-energize the autopilot. Repeat the check with the pre-set unit knob set in the 3° and 6° positions.

b) Repeat the check as specified in step "a" with the pre-set unit knob set 40 "UP". In this case the elevator wast move through an angle of 40 ±10 24, up.



to TKC System
See dwg. KC-7406-10
2) Test plug connector ULP481K243UL2
3) N-4 servo unit (ailerans)
4) N-4 servo unit (rudder)
5) N-4 servo unit (elevator)
6) Filter
7) N-18M0 timer
8) N-2 gyro unit
9) Cable No. 9
10) Cable No. 9
11) K-1-13M unit
12) Cable No. 3
13) NAT-19A inverter
14) Cable No. 2
15) N-1 control panel
16) PN-2 relay
17) K-20A, contactor
18) Junction bcx (see dwg. 7201-00)

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- b. In two stop-watches are available check the programmed operation at a chagin switching-on of the H-ISMO timer.
- 9. Check how the control surfaces are controlled by the free gyros: smoothly turn the H-2 gyro unit through an angle of $\pm 45^{\circ}$ in yaw, $\pm 25^{\circ}$ in pitch and $\pm 40^{\circ}$ in roll. The control surfaces must smoothly, without jorks, deflect in accordance with Table No.4.

Then stopping the Π -2 gyro unit being deflected, the control surfaces and afteress must not return to the neutral positions.

NOTE: Before checking the pitch control, turn the gyro unit in pitch, with the ffee gyros caged, through an angle of 10° in the direction opposite to that checked. Then, one minute after the autopilot is uneaged, check the control system.

Perform a similar check with the unit turned in the opposite direction; proceed as specified in this note if the turn table does not permit turning the E-2 unit in pitch within ±25°.

Tuble No.4

Channel	Lirection of gyro unit		Direction of deflection				
	turn		Rud	der	slevator	illerons	
Direction	to the right	tο	the	lert	_	right aileron down	
Pitch	ùp		-		down		
Roll	to the right		-	* 🖽	_	right aileron down	

- b. In two stop-watches are available check the programmed operation at a single switching-on of the H-REMO timer.
- 9. Check how the control numbers are controlled by the free gyros: smoothly turn the N-1 gyro unit through an angle of ±45° in year, ±25° in pitch and ±40° in roll. The control surfaces must smoothly, without jorks, deflect in accordance with Table No.4.

when stopping the N-3 gyro unit being deflected, the control surfaces and afferess must not return to the neutral positions.

HOTE: Before enecking the citch control, turn the gyro unit in pitch, with the ffee gyros caged, through an angle of 40° in the direction opposite to that checked. Then, one minute after the autopilet is uncaged, check the control system.

Perform a similar sheek with the unit turned in the opposite direction; proceed as specified in this note if the turn table coes not permit turning the I-I unit in pitch within ±25°.

Table Mo.4

Channel	Tirection of	CV 470 MIN	hirection of deflection				
	turn		Rudder	wlevator	lilerons		
Direction	to the right	to	the left	<u></u>	right a i leron down		
Pitch	üp	 		down	-		
Roll	to the right	1		_	right aileron down		

- timer.
- 9. Check how the coastel surfaces are controlled by the free gyres: smoothly turn the H-2 gyre unit through an angle of $\pm 45^{\circ}$ in yaw, $\pm 25^{\circ}$ in pitch and $\pm 40^{\circ}$ in roll. The control surfaces must smoothly, without jerks, deflect in accordance with Table No.4.

when stopping the N-0 gyro upit being deflected, the control surfaces are afternos must not return to the neutral positions.

MOTE: Before checking the pitch control, turn the gyro unit in pitch, with the ffee gyros caged, through an angle of 10° in the direction opposite to that checked. Then, one minute after the autopilot is unpaged, check the control system.

Perform a similar sheek with the unit turned in the apposite direction; proceed as specified in this note if the turn table does not permit turning the N-3 unit in pitch within ±25°.

Table No.4

Channel	girection of		birection of deflection				
	turn		Rudder	dlevator	\ilerons		
	Direction	to the right	to	the left	_	right aileron down	
	Pitch	ip		*5100	down	-	
	Roll	to the right			_	right aileron down	

4. In two stop-watches are available cleak the programmed operation at a single switching-on of the N-18MO timer.

9. Check how the control ourfaces are controlled by the free grees: smoothly turn the N-2 gyro unit through an angle of ±45° in year, ±25° in pitch and ±40° in roal. The control surfaces must smoothly, without jorks, deflect in accordance with Table No.4.

when stopping the N-S gyro unit being deflected, the control suridoes and ailerous must not return to the neutral positions.

Before checking the pitch control, turn the gyro unit in pitch, with the ffee gyros caged, through an angle of 10° in the direction opposite to that checked. Then, one minute after the autopilot is unpaged, check the control system.

Perform a similar check with the unit turned in the opposite direction; proceed as specified in this note if the turn table does not permit turning the 11-2° unit in pitch within +25°.

Table No.4

Channel	lirection of		Direction of deflection				
	turn	-	dude	er	slevator	Allerons	
	Direction	in the right	to	the	left		right aileron down
	Pitch	i up				down	- .
	Roll	to the right		orie	Y	. –	right aileron down

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b. In two stop-watches are available check the programmed operation at a chapt. Switching-on of the M-18MO timer.

9. Check how the control surfaces are sectivalled by the free grees: smoothly turn the N-1 gyro unit through an angle of ±45° in year, ±25° in pitch and ±40° in roll. The control surfaces must smoothly, without jorks, deflect in accordance with Table No.4.

when stopping the N-2 gyro unit being deflected, the control suriaces are alleress must not return to the neutral positions.

Before checking the pitch control, turn the gyro unit in pitch, with the ffee gyros caged, through an angle of 10° in the direction opposite to that checked. Then, one minute after the autopilot is uncaged, check the control system.

Ferform a similar check with the unit turned in the apposite direction; proceed as specified in this note if the turn table does not permit turning the B-S unit in pitch within ±25°.

Table No.4

hannel	Hirection of	birection of deflection				
	turn		slevator	Milerons		
birection	ic the right	to the left		right aileron down		
Pitch	ùp	_	down	- 		
Roll	to the right		_	right aileron down		

b: In two stop-watches are available check the programmon operation at a conglo switching-on of the M-ROMO timer.

9. Check how the control surfaces are nontrolled by the free gyros: smoothly turn the N-1 gyro unit through an angle of $\pm45^{\circ}$ in yew, $\pm25^{\circ}$ in pitch and $\pm40^{\circ}$ in roll. The control surfaces must smoothly, without jorks, deflect in accordance with Table No.4.

when stopping the N-2 gyro unit being deflected, the control surfaces and aileress must not return to the neutral positions.

MOTE: Before checking the pitch control, turn the gyro unit in pitch, with the ffee gyros caged, through an angle of 10° in the direction opposite to that checked. Then, one minute after the autopilet is uncaged, check the control system.

Perform a similar check with the unit turned in the opposite direction; proceed as specified in this note if the turn table does not permit turning the 3-2 unit in pitch within ±25°.

Table No.4

Channel	Lifection of	Pirection of deflection				
	turn		slevator	literons		
birection	in the right	to the left		right sileron down		
Pitch	ùp	_	down	-		
Roll	to the right		_	right aileron down		

b: In two stop-watches are available cleak the programmed operation at a single switching-on of the 11-12MO timer.

9. Check how the control curfaces are menticalled by the free gree: embethly turn the Tall gyro unit through an angle of $\pm45^{\circ}$ in year, $\pm25^{\circ}$ in siten and $\pm40^{\circ}$ in roth. The control surfaces must smoothly, without jerks, deflect in accordance with Table He.4.

when stopping the N-2 gyro unit being deflected, the control surfaces are afteress must not return to the neutral positions.

GOTE: Before checking the pitch control, turn the gyro unit in pitch, with the ffee gyros enged, through an angle of 10° in the direction opposite to that checked. Then, one minute after the autopilot is uncased, check the control system.

Perform a similar shock with the unit turned in the opposite direction: proceed as specified in this note if the turn table does not permit turning the 3-3 unit in pitch within ±25°.

Pable No.4

Channel	rirection of the gyro unit turn	! !	lirection of deflection					
			dudder	1	Slevator	lilerons		
Direction	to the right	to	the lef	t		right sileron down		
Pitch	ùp	1	108.	1	down	- .		
Roll	to the right					right aileron down		

b. If two stop-watches are available check the programmed operation at a single switching-on of the H-18MO timer.

9. Check how the control surfaces are controlled by the free gyros: smoothly turn the N-2 gyro unit through an angle of $\pm45^{\circ}$ in yaw, $\pm25^{\circ}$ in pitch and $\pm40^{\circ}$ in roll. The control surfaces must smoothly, without jorks, deflect in accordance with Table No.4.

when stopping the N-2 gyro unit being deflected, the control surfaces and afterens must not return to the neutral positions.

MOTE: Before checking the pitch control, turn the gyro unit in pitch, with the ffee gyros caged, through an angle of 10° in the direction opposite to that checked. Then, one minute after the autopilot in uncaged, check the control system.

Perform a similar check with the unit turned in the opposite direction; proceed as specified in this note if the turn table does not permit turning the 3-2 unit in pitch within ±25°.

Table No.4

	[hannel	lirection of		Eirection of deflection			
-	turn		Mudder	slevator	llerons		
	Direction	to the right	to	the left	,	right aileron aown	
	Pitch	ùp			down	- .	
	Roll	to the right			-	right aileron down	

40. But the COUNTY HE STATE OF THE TENT In the "Z-4H SIMULCORF position. The "Y-4H LEMBERTHE" wanting light must come on.

The rocalist No.1 warning light most become illuminated. Then commune No.1 to dent, the control surfaces may deflect from the position, or upact in them control the command is sent, through the angles within 11.6 (elevator and allerons) and ±0.0 (reduct).

The range position: is this case the second and allerons much move to the range position: is this case the second and allerons much move to the range position: is this case the second and allerons much move to the record position.

Topost the medication of the Title Street to the

The allevator much move to the zero position. School the check with the "ILLVATOR" know to the zero position; in only case the elevator much move to the zero position. School the check with the "ILLVATOR" know to the zero position.

NOTE: The time, required for sending a signal of one polarity, should not exceed to sec.

panel. The "GET TO A.S.2" capaing light must become illuminated check how the control curfaces are controlled by the "RUDIME" and "RIDIV TOR pro-10% uplies on the centrol panel in the name manner as when some and contains to 10.1; In this case, when setting the "RUDIME" and "The VATOR" had a in the zero positions, the control surfaces must not not to the neutral position.

12. Set the "COMMINE No.4" and COMMINE No.2" switches in the "OFF" position and the "FOUR RESERVED EWIFCH" on the control panel - in the "Section of the New Control unit in the "OFF" position and if the autopilot has exerated for more than 60 min.make an interval for not less than 50 min. to coul the New Gyre unit.

13. Switch on the [1-] control unit "FOLAR switch. After the "BUBU SERO" warning light comes on (but not earlier than 3 min. after power is supplied) press the "ENCAGING" button on the control punch.

The "CROKE" werning light must go out and the "UNCAGNIC" warning light must some on.

After 5 min., check the autopilet free gree precession. The grees rigidity should be so that the control surfaces decleration from the neutral position for 5 min. would not exceed: runder \pm 1.25° clevator \pm 2.5° allerons \pm 1.25°.

then cheaking the gyres rigidity, the Lee gyre unit must be in the horizontal position.

HOSE: Ple dilerons derilection depends also on the yew free gyre presentation (due to a signal pieded up from the coordination potentiometer): therefore before actormating the value of the roll free gyre precession, set the reduct in the neutral position by turning the Tell gyre unit in yew. In this case the allerons deflection from the neutral position corresponds to the roll gyre precession.



- 14. Set the "POWER" switch on the H-1 control panelin the "OFF" position. Disconnect the H-2 gyro unit plug connectors and remove the unit from the turn table.
- 15. Nake entries about the autopilet checks performed in the "KC" missile Log-Book.
- 16. Install the \mathbb{R} -2 unit in the missile and check the autopilot operation as follows (steps 17-24).
- 17. Connect plug connector No.36 of the ground test panel to the autopilot board check plug connector No.36 via the connecting cable, control panel plug connector No.12 through the connecting cable to plug connector No.12 of the missile wiring system having disconnected this plug connector from the K1-13M unit and connect plug connector No.45 through the control panel connecting cable to plug connector No.45 of the L-2 gyro unit having disconnected it from the missile electrical system.

Switch off all the switches on the control panel, supply power of 28±0.5 V d.c. to the missile electrical system and 26 yelts to the "+" terminal of the control panel.

18. Switch on the "POWER" switch on the N-I control unit. The NAI-IVA inverters must start operating. The "CAGED" and "BASES ZERO" warning lights on the control panel must become illuminated.

The control surfaces should be set in the neutral position.
The indicator pointers on the control panel must be in the

19. Ewitch on the "POWER" and MCHECK" switches on the con-

panel, firm the Thungar Stables, stie, son red casel

- 14. Set the "POWER" switch on the Tall control panel in the "OFF" position. Disconnect the Tall gyro unit plug connectors and remove the unit from the turn table.
- 15. Nake entries about the autopilet checks performed in the "KC" missile Log-Book.
- 16. Install the N-2 unit in the missile and check the autopilot operation as follows (steps 17-24).
- 17. Connect plug connector No.36 of the ground test panel to the autopilot board check plug connector No.36 via the connecting cable, control panel plug connector No.12 through the connecting cable to plug connector No.12 of the missile wiring system having disconnected this plug connector from the K1-13M unit and connect plug connector No.45 through the control panel connecting cable to plug connector No.45 of the M-2 gyro unit having disconnected it from the missile electrical system.

Switch off all the switches on the control panel, supply power of 28±0.5 V d.c. to the missile electrical system and 26 volts to the "+" terminal of the control panel.

18. Switch on the "POWER" switch on the MI control unit. The MAI-I A inverters must start operating. The "CAGED" and "BASES ZERO" warning lights on the control panel must become illuminated.

The control surfaces should be set in the neutral position.

The indicator pointers on the control panel must be in the middle positions.

19. Switch on the "POWER" and "CHECK" switches on the control panel. Turn the "RUDDER" knob on the control panel.

- 16. Let the "FRATE switch on the Tay control panel in the "GAF" position. Tisconnect the Tay give whit plu, connectors and remove the unit from the year table.
- 15. Nake entries about the autopiles obecks performed in the "KC" missile Fog-Book.
- 16. Install the $\mathcal{P}_{-\mathcal{N}}$ unit in the missile and crock the autopilet oberation as follows (steps 17-24).
- 17. Connect plug connector No.36 of the ground test pench to the autopilet board sheek plug connector Lo.36 via the connecting cable, central panel plug connector No.42 through the connecting cable to plug connector No.42 of the missile wiring system having disconnected this blug connector from the N1-43M unit and connect plug connector No.45 through the control panel connecting cable to plug connector No.45 through the graph unit having disconnected it from the missile electrical system.

dwitch off all the switches on the control panel, supply power of 28±0.5 V d.s. to the miscale electrical system and 26 volts to the "+" berminal of the control panel.

18. Switch on the "FOURS" switch on the Self control unit. The SALES A inverters must start operating. The "CAGRE" and "BASES ZERO" warning lights on the control panel must become illuminated.

The control surfaces should be set in the neutral position.

The indicator pointers on the control panel must be in the middle positions.

19. Switch on the "POWER" and "CHECK" switches on the control panel. Turn the "RUDDER" knob on the control panel.

The truther and ellerons must delie at. Turn the FOURDERS knob in the opposite direction. He runder and allerons must move in the opposite birection, at the THE 2011 knob in the zero position. Turn and a LLV/d of knob in the control panel. The elevator and the filters to the THE 2011 knob in the opposite currenton. The elevator and conflict in the opposite direction. But the THE 2010 in the zero position.

the control numbers rows to the matrix position, tail, till the control numbers rows to the neutral position and the "BASES CERO! warning limit some on.

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to the initial contten.

24. Witch on the FT of all and swatch on the destroic pinel. The FOUNDAL Rest of the mast come up. Form the "TUTALL knot on the control and as

The realer of sine, or what deflect.

Let the TUCK of hand is the same positions in this base the runder and allerent but it is to the neutral position. Repeat the shock when turning the ""Table case in the establish.

Turn the Third Police know on the control point. The rudder must deflect. Det the laborator has a known to the neutral edition.

The rudder has been position.

The rudder the check with the Third Police and the opposite aircotion.

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- D. Betting the folder of the TTER CONTROL & TTER of the control panel in the different two and the control panel in the different two and the fire gard and the fire gard and the fire gard and the control of the volumence tensions.
- 4. Henouse as specified in stop 1 with the ga2 gyro unit turned about the vertical existin the registing succession:
 - so the rapid arough the engine of: $(0, 1', 6^2, 3', 45')$; reverse travel: $(0, 3^0, 2^0, 0)$;
 - to the left through the ungless of $(1/3^{\circ}, 6^{\circ}, 9^{\circ}, 11^{\circ})$ reverse through $a^{\circ}, 9^{\circ}, 2^{\circ}, 6^{\circ}$.
- left, but off hear buy to the Temporal time unit, the Therman with at the Tell convert panel our than send the Third Williams
 - <u>North</u> is a west as specified in steps 3 as a for not more than min.
- g. New the "Person switch on the $\omega_{\rm p}$ contgot panel in the "GIV" position.

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then contain professionally steem the enterplet units theory or the in the set of spare parts, tooks and devices in the same among a the autopilot and its individual units which were not installed in the "KA" missile and which are attend in the cases.

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- 1. her aboring the AMA-E dute-iles in the Wir missile (or with the A-A-April unit received from the missile) preserved in accordance with the present Wi-05-III; edition III; instructions on preservation and extended storage of the WCF winged mis ile, check after every 4 months 10% of the AMA-IB autopilets of the batch but not less than C autopilets.

res:

Make The hoods is a number of autopiless subjected to

- 2. has aboring the 35 L. substitled in the "10" mistile cover d with a sampacin tower in the emper, check all 400% of the autopity of the subsplice of less than each a meath.
- insulfied the line wise to the autopilate, much some not insulfied to piece the missile, and the autopilate instituted units a field in cause, mark after so as a morabe in or the industrial autopic act autopilate (units).
- 4. The dealth shock of specified in step 3 the light number 3.00 % of the test of dealth design dealth the gravious periodic contest.
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 - hells the second the second acceptance in the head of the head of
- 6. The tipe, requires for a continuous operation of the mutagilat anergies during all to chapter specifies in these forces, and not or there is a view of leakage of the last of the leakage.
- If he wood, all is to mithed to charge the supercolor of whater it was a procession of whater it was a procession of the contraction of the contra

7. If the restautopilets, taken for the next check in ture, are defective (corresion included), check an additional number of the autopilets equal to the initial number of the naterilens to be encoked.

If similar or some other deferts are found in the autopilots included in the batch.

6. If coming the shoot of an additional number of the Albert number library (checked negations to step 6), defeats are not found, all the outside of the latch checked (defective); resoluted) can be additional to a further storage.

The cap of colivering the unsatisfactory reports and celimination of defects in the defective units is given in the "Incorportions for saming up the unsatisfactory reports".

- the inspection and shows in the sertificate for the subspilet and its individual suits.
- the periodic checks during sporage, is otermined by the time exequired for the checks appointed by these instructions.
- 11. There the expiration of the ATK-5E autopilet storage life (for all secolities storage constitions), check all the

autorilots as specified in these. Instructions for the periodic checks during storage.

The decision on the ATA-Mautopilot further storage and operation is adopted by the comission appointed by the organization commander.

- 12. CHECKING THE ANGLES AUTOPIDED CREETION IN DECARCE.

 WITHOUT REPOVING IS DONE THE *MO* HISSILD.
- 1. After depreserving the "MC" missile and attaching the .
 missile wings, remove the Fra .gyre unit from the missile.

Visually inspect all the autopilot units. Check that the units and cables outer surfaces are free from damage.

If parridon is found on the auto; ilst units, proceed as outlined in steps 7-8, par. 20, these instructions.

missile wiring system and check the M-4 servo unit as indicated in part 6 (steps 3-6); when checking the M-4 rudder servo unit, connect plug connector No.32 to the M-1 panel, when checking the M-4 elevator servo unit, connect plug connector No.32 and when checking the M-4 ailcrons servo unit connect plug connector No.35.

SCOLD: 1. During this check the N-4 servo unit outlet shaft direction of rotation indicated in

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- par. 6 (steps 3-6) corresponds to deflection of the control surface (ailerons) connected to the H-4servo unit to be checked.
- 9. Then checking at a temperature below 0°C, when storing the "KC" missile in the hangar), the fi-4 servo units sensitivity must be:
- units without disconnecting plug connectors Nos.32 and 34 via plug connector
 31 by means of the connecting cable.
 After checking the Hell serve units,
 connect plug connectors Nos.32 and No.33
 to the missile wiring system.

- 4. Furing the ATK-53 autopilot storage under normal conditions the sensitivity of the H-4 serve units installed on a fixed base should be 0.5-1.2 mA with the "WINDING CRIECTOR SWITCH" in "1", "2" and "3" positions and 0.95-2.22 mA in the "4" position.
- 3. Misconnect flug connectors Nos40 and 44 of the missile wiring system from the locality inverters and check the inverters operation as outlined in par. 6(steps 8-10).

NOTE: Then checking the HAT-1 A inverters at a temperature below 0°C (when storing the "KC" missile in the hangar) use the AH-3 panel with the TEM-70 and AH-70 test instruments only to check rotation of the H-4 panel giro moters without measuring the input-and output current and the voltage generated by the inverter.

- 4. Install the Mac gyro unit on the MMAS turn table and connect the gyro unit plug connectors as indicated in par. 8 (steps 3 and 4).
- 5. (back the autopilet operation as specified in par. 8 (steps 5-13).

NOTES: When checking at a temperature below 0°C (when storing the "KC" missile in the hangar):

a) apply the "UNCAGING" command, 6 min. after power is supplied;

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b) the elevator must return to the initial position 40-43 sec. arber the " II-ISMO START." button is pressed

6. Check the time required for the yaw and pitch gyro bases to match in the zero position as follows: switch on the "POWER" switch on the N-I control panel. After the "BASES ZERO" warning lights come on, set the "POWER SMIECTOR SWITCH" in the "BOARD CHECK" position and switch on the "CHECK" switch. The "BOARD CHECK" and "CHECK" warning lights must come on.

Tully turn the "RUDGES" knob on the control panel to the "RIGHT". The rudder must smoothly, without jerks, deflect to the right and the right alleron must deflect up. Wait for 7 min. Set the "RUDGES" knob in the zero position and the "CHTCH" switch in the "CFF" position. The rudder must move to the neutral position. After 4.5-6.5 min. the milerons must move to the neutral position and the "BASES ZERO" warning lights must some on.

Switch on the "CHECK" switch and repeat the check with the "RUBER" knob turned to the "BETT",

After the "Biggo 22RO" warning lights come on switch on the "CHOUR" switch and fully turn the "ELDVATOR" knob upward.

The elevator must smoothly, without jerks deflect up.

Make an interval for 4 min. Set the "FLEVATOR" knob in the
zero position and the "CHECK" switch in the "OFF" position.

The elevator must move to the neutral position. After 2-3.5min
the "BASES MERO" warning light must come on.

Switch on the "CHRCK" switch and repeat the check with the "RHEVATOR" knob turned to the "DOWN" position.

Check the time required for the bases to match at a supply voltage of 26 V.

7. Check the autopilot transmission ratios as indicated in par., 15, step 6.

(when storing the "KC" missile in the hangar):

a) make an interval for 7.5 min. when sending the "FIRECTION" signal; in this case the BaSES

ZERO" warning lights must come on 4-7 min.

after the "CHECK" command is removed.

- b) when sending the "PITCH" signal, make on interval for 5 min.; in this case the "BASES ZERO" warning lights must come on 1.5-4.0 min. after the "CHECK" command is removed.
- c) do not check the autopilot transmission ratios.
- 2. When storing the "KC" missiles in the hangar, check the time required for the bases to match once in 6 months.

8. Set the "POWER" switch on the II-I control panel in the "OFF" position. Disconnect the II-2 gyro unit plug con-, pectors and remove the gyro unit from the turn table.

Install the II-2 gyro unit in the "KC" missile and oneok the autopillat operation using the IHK, ground test costrol panel of outlined in par. 8 (steps 17-24).

D. Enter the results of checks and time required for quac as the units and nutopilot set energized in the certificate the individual units and ANN-38 autopilot set. 10. It is permitted to shock the fire gare unit in a reference or any other serviceable autopilot set system as indicated in par. ((steps 44-2)).

In this case we not check the autopilot stored in the set but shock the Ind serve unit, I-1.10 timer and FAT-IOA inverter which are stored in the missile as follows:

- a) 1-4 serve units soutlined in par. 6(steps 3-t;
- b) hell/ timers is outlined in steps 11-13, this para
- c) 122- A inverters as outlined in par. 6(steps 8-10)
- disconnect rlug connector No.33 from the missile wiring system but the "100.15 switch of the NI-I panel in the "OPP" position.

upply power of 76 V a.c. to the control panel. Connect the Thing of the Connector No.33 to the panel via the constant option set the Things selector switch in the "Things" position and the "IN ING OPIECTOR CATTOR" in the CO position.

id. Which on the "PO R" and "FEETBACK" switches. The elevator much dive to the district position (2.5°-3° Up from the geometric neutral position).

Switch on the 2-11A 12.77. switch and simultaneously start the stop-watch. 2-3 sec. after the * H-18MO START.* switch is in the electors must deflect through an angle of 9-9.5° Up from the initial position (12-12.5° Up from the geometric neutral position) and 40-42 sec. after the switch is 1% the electron post return to the required initial position.

Start the N-18Maimer twice. Then starting the timer for the first time, check the elevator angle of deflection and the program starting time (2-3 sec.), to do this, start the stop-watch when the elevator deflects upward. Then starting the timer for the second time, check the time of the program completion (40-40 sec.): to do this, stop the stop-watch when the elevator begins moving to the initial position. The second check is performed 20-30 seconds after the first actuation of the program is over.

- reconstat if the elevator fails to deflect through an an leaf 120-12.50 up from the geometric neutral position.
 - 2. If it is necessary to check the programmed operation for the third and subsequent times, bear in mind, that the U-1070 timer operating duty is intermittent consisting of 6 cycles followed by a complete occling. A cycle implies one actuation of the program.
 - o. If two stop-watches are available, check the program at a single switching-on of the I-ISMO timer.
- 13. Not the *POWER" switch on the panel in the "OFF" posttion. Disconnect the panel from the H-18MO timer plug connector and connect this plug connector to the missile wiring system.

- 43. CHECKING THE AFFI-58 AUTOFILOT OPERATION IN STORAGE WITH SOME UNITE RAMOVED FROM THE MISSING
- 1. After the The missile is depreserved and its wings are attached, visually inspect the H-I control panel, H-I servo units, H-IoM; timer and HAI-IoM inverters which are stored installed in the missile. Open the case with the H-Io gyro unit as included in par. 3. and visually inspect the unit. Check that its units outer surfaces and cables are from damage.
- If corresion is detected, proceed as outlined in steps 7-8, par. PO.
- 2. Throw the All-Mautorilot as indicated in par. 12 without chesking the autopilot set by means of the Paul ground test control panel.

ther shocking the 1-2 gyro unit, pack it in a metal case is indicated in par. 1(without packing the 1-1 control panel). Inter the results of checks and time required for checking the units and autopilet set energized in the certificates for the individual units and AUC-33 autopilet set.

- 14. CHRORING THE ATTO-SCAUPOPILOT VIN STORING IT PACKED IN TOTAL
- of seals and for freedom from damages. Unpack the autopilot units as indicated in pur. 3. Inspect all the units. Check the outer surfaces of the units and cables for freedom from damages.

- 43. CHECKING THE ANTI-59 AUTOFILOT OPERATION IN STORAGE WITH SOME UNITS RAMOVED FROM THE MISSILE
- 4. After the "FO" missile is depreserved and its wings are attached, visually inspect the F-I control panel, H-4 servo units, E-(CM)—timer and HAI-1 A inverters which are stored installed in the missile. Open the case with the H-2 gyro unit as incleated in par. 3. and visually inspect the unit. Check that the units outer surfaces and cables are free from damage.
- 16 corresion is detected, proceed as outlined in steps 7-8, pur. 10.
- 2. The six the lift-year of ilot as indicated in her. 12 without checking the autoritot set by means of the EMK ground test contact senot.
- case as indicated in par. (without packing the J-I control panel). Inter the results of obacks and time required for checking the units and autofilet set energized in the certificates for the individual units and ADD-3B autopilet set.
- 14. CHROKING THE STE-SEASTOPILOT FOR STORING IT PACKED IN TELU
- of seals and or freedom from damages. Unpack the autopact.

 units as in loated in pur. 7. Irsp. 11 the units. Check the

 outer surfaces of the units and cables for freedom from damages.

If corresion is found on the autopilot units, proceed as outlined in steps 7-3, par. 29, these Instructions.

- 2. Check the N-4 servo units as indicated in par. 6 is (steps 3-6); in this case, under normal conditions the sensitivity of the N-4 servo units installed on a fixed base is equal to 0.5-1.2 mA with the "NINDING SELECTOR SWITCH" in 144, "2" and "3" positions and 0.95-2.22 mA in the 44" position
 - 3. Check the MAI-IA inverters as indicated in par. (steps &-10).
 - 4. Check the autopilot set operation as outlined in par. 6 (steps 14-23) and time required for the bases to match as outlined in par. 12 (step 6).

After the check is completed, pack the autopilot units in the metal case as indicated in par. 1 and enter the results of checks and time required for checking the units and autopilot set energized in the certificates for the individual units and set of the ADN-58 autopilot.

- 15. PROCEDURE OF REPLICING THE ARA-SBAUTOPILOT INDIVIDUAL UNIT. AND COMPONENTS
- 1. If during the ML-58 autopilot operation and storage defects are found, replace the H-I , H-2 , H-4 , H-18MO HZ-6M units, HZ-I,HZ-1, HZ-4,HZ-6AM, components, polarized relay and trimming rheostat in the H-2 gyro unit, HZ-1MO component in the H-4 servo unit and H-4-IMO component polarized relay.
- 2. Remove and install the units to be replaced in the RC. missile in accordance with the "Maintenance and Operating in Instructions for the "K!" Winged Missile", Book I.

as follows:

remove the scal and unscrew by socket wrench two stude stateshing the derective NA-IMO component to the D-4 servo unit and remove the commonent from the unit. Install a new NA-IMO component on the NA servo unit.

carefully insert two attaching study of the component into the holes in the component casing and tighten the study by the socket wrench; tighten the study alternately, and evenly, secure the study with a locking wire and seal it with the using organization seal.

4. Replace the PAO polarized relay in the N-2 gyro

Unscrew 6 screws attaching the E-2 tyre unit side cover.

Unscrew 4 screws attaching the defective relay to the ER-OM

(ER-SAM) component and remove the relay out of the unit.

Carefully install (without touching the electric wires) a

new planized relay in the IR-SM (ER-SMA) component

and tighten the relay attaching screws; tighten the screws

alternately and evenly. Secure the screws with AR-20 nitro

glue according to instructions No. MB-ER (See the appendix).

Sorew the H-A unit side cover, in this case safety the

screws with AR-20 nitroglue according to instructions

No. MB-SEI.

5. Replace the trimming rheostats as follows:
Remove the R-2 gyro unit lower cover.

Unsolver the wires from the trimming rheostat to be replaced and measure the resistance set for the given rheostat. 3. Replace the limital component in the line serve unit as follows.

remove the scal and unsered by spoket wronch two stude attaching the actuative PA-ISO component to the PAG servo unit and remove the commonent from the unit. Install a new PA-ISO component on the PA-ISO component.

into the holes in the component casing and tighten the stuck by the macket we ach: tighten the study alternately, and evenly, second the study with a looking wire and scal it with the using organization seal.

4. Culline the U-D relarized relay in the U-D gyrounit as Echlows:

Unserew Course attaching the I-P gre unit side cover.

Unserew Parene attaching the Refective relay to the IR-Ma

(iR-LMa) commons and remove the relay out of the unit.

Carefully install (without touching the electric wires) a

new plantized relay in the IR-67 (Re-MA) component

and tighten the relay attaching screws; tighten the screws

alternately and verify, decure the screws with AK-RU nitro

glue according to rustructions No. MB-MI (see the appendix).

Sorew the I-R out olde cover, in this case safety the

screws with AR-20 nitroflue according to instructions

No. MR-321.

5. Replace the prinming rheostats as follows: Romove the page agro unit lower cover.

Unsolver the wires from the trimming rhoostat to be replaced and measure the resistance set for the given rheostat remove the sear and anser. Ly stake, whench two stude attending the search time "the self component to the Fee servo unit and comes has been another the ania. Install a non[4-13] case one to the the court unit.

desciulity indext was absorbing state of the component into the cold of the component washing the tighten the stars by the socket was acht eighten the stade allermately, and evenly, colored to office with a linking rise and scal it with the using organic this sear.

4. April 18 to The modernos relay in the Bell gyrounit as Echiose:

Unservation of the first the first unit side eaver.

Unservation at a color to endeath or relay out of the limit.

Carefully install limit touching the electric wires) a

new plantage color at the A-W (1-0A) comparent
and tighten that the estimate acrews tighten the screws
alternately are the screws with M-RU nitro
give according to the first cover, in this age safety the
screws with M-RU mits according to instructions

No. Markov.

5. The lase the or energ theortats as follows: Romove that [1] gran unit lawer cover.

Unsellar the sizes from the trimming rheestat to be replaced and passing the resistance set for the given rheestat. 3. Africa to the appropriate to the fell north unit as (3) have

remove the self on annual to component to the Sec octive unit self so the Sec octive unit self self and the self a nor self self self self.

into it. The is the street ing stars of the engineent into it. The companent that it is not earlied the stars by the color of the stars are also included, and evenly, the color of the stars of the stars are start of the star of the the stars of the stars.

4. The we will observe the plantage of the best grant to the second

Unservationally and the feeting relative relativ

5. The the transming shootets as follows: Theory: West and I with lower count.

Unsel or file with a free the trimming the suit to be replaced the market the resimble out for the given rheestat.

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2. Arks - 1 well component in the deliberro unit as 1000 to

not to the second message at some second two stude as a second that is a second to the Second which is a second white second to the Second white second white second second second second white second and the second white second second white second white second white second white second white

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and the first the state of the second of the

D. To, home the her among simostats as follows: Tamever the angular will sower course

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s. Atlant to an imponent in the 1-1 serve unit as follows:

make allowed and ansatz. It sucked whench two studes a subtribility is a first directly open open to the Fee sorrounit to the anit. Install a now is a subtribility of the state of the sta

into the component in the component into the study of the component into the study of the component into the

a. The way the state of the contract relation to the Best symmetric section of

incipes and all the infective relative the Eight for the unit.

Thresolve the following the cleatric vires) a new first following the cleatric vires) a new first following the cleatric vires) and the first following for each tighten the screws with incipe and the following for the screws with incipe all the classical productions have the constant for the appendix.

The first following to instructions in the screws with the screws with the classical productions and the constant for the appendix.

D. 1-, 1-,e the recording theoretic as follows:

Uns the first the frame the brimming reseased to be replaced to be restationed out for the given rheostat

3. Lerin " I would normanent in the let serve unit as follow:

which the seal and about the socker whench two studes a distributed to the few sorrounds that the seal and a component to the few sorrounds that the seal and a continue the source desired and a continue the seal and the seal a

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unit work the t

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Incores to the feeting roley to the Time's formers in the unit.

Incores to the feeting the electric cures; a new training the electric cures; a new training to the electric cures; a new training of the electric the screwe which are the screwe with the screwe with the electric process with the electric process. The training of the electric approach; the electric the approach; the electric the electric process with the electric process. The electric process with the electric process with the electric process.

There you was a supplication of the control of the

as tellers.

up. on the real and inverse to speker wrinch the stude abit thing it is the first limit of component to the few poerro white the first and another than the investigation of the first carea quit.

then finely than the two lateraling study of the organisms that it is the error once the study and tighter the study of the lateral problem is also included in the transfer of the wind a looking wire and wend it with the upon them.

w. This we want it collected rating in the Tell gyrounds on tellinguit

Incores the first the first to the relay out of the unit.

Therefully the first third to the the cleaters wires) a new thorse with the first the first the first the screws and tipned the first the first the screws with the first alternation.

The the first the first the first this case safety the screws in the first case safety the screws in the first case in the screws in the screws

D. D. Line has in thing Disortais as follows: Tamever such and passes unit lower cover.

Unseless the street the free the trimming throatest to be replaced the placestate the design of the given theoretate.

Unscrew the screws attaching the plate with the trimming, rhectate to the IL. The unit earing. Enserew the nut attach-; ing the rheestat to be removed and remove the rheestat.

Install new choostat in place. Secure the rheestat by a screw with a nut (place a washer under the nut).

Install the reflected sithout one cant, the adjusting screws must have a elemented between the screw head and hole in the upper plate.

bet the recented registance equal to that measured before the rhoose it is replaced.

with the property of the triming releasint. Its on the glate the triming of a triming releasing the property of the screws (place we have under the screws (place we have under the screws).

delet, the following screen and note with W-60 mitrodisc according to the reference to Westella.

- . 6. There say a governit is require, present a relieve
- a) the draw when him each energibers is obtained in the desired, part of the desired and the auto-like who where the she does miscile and the desired when we have a removed from the desired as outlines in a stored in the desired.

b) composition that added them because rate, we rescribe:

- Note: a property of the property of the post of the property o
 - the retire of machine the Adie of Autopinot presents a ration refuse to other point the serve of the anti-like in our premiseits.

If the autopilots are packed in the cases the methods of checking the autopilot transmission ratios are the same; in this case the ammount of the Mark servo units outlet shafts turn must be:

With the H-S gyro unit deviated in yaw; direction control surface(rudder) - 2.25-2.75°(instead of 2.1-2.9°) roll control surface (aileron)4-5° (instead of 3.8-5.3)

With the M-2 gyro unit deviated in pitch;

elevator $-4.5-5.5^{\circ}$ (instead of 4.3-5.8)

with the property gyro unit deviated in roll:

roll central ourface(aileron) _ 4.5-5.5 (instead of 4.3-5.8).

), Check the autopilet transmission raties at a rewer supply of 26 % d.c.

Check the rudder transmission ratio and the engle of the 11.4 alleron serve unit turn controlled by the coordination signals as follows:

in yaw through an incle of 5° . The rudder must deflect 2.1-2.9° and eiterons - through an angle of 3.8-5.3°.



furn the II-2 unit in opposite direction through an angle of 5° in yaw. The rudder and allerons must deflect respectively through the angles of 2.1-2.9° and 3.8-5.3° to the opposite side.

- NOTES: 1. The difference in the allerons deflection in both directions must not exceed 0.5°.
 - 2. If the rudder deflection does not meet the resulted value, adjust the H-2 gyro unit rheostat No.3 connected in the yaw free gyro circuit? To do this, remove the lower cover of the H-2 gyre unit and rotate rheestat No.3 screw till the required deflection of the rudder is obtained. It is permitted to adjust the rheostat No.3 within 290+29 chms. The place of the bridge connection for checking the resistance value is given in Table No.3
 - J. If the allerons deflection does not meet the required value, adjust rheostat No.12 connected in the coordination signal circuit. It is cormitted to adjust rheostat No.12 within the range of 300±30 ohms.

Check the elevator transmission ratio as follows:

[after sending the "UNCACING" command, turn the N-2 gyro

unit in pitch through an angle of 5°. The elevator must deflect

4.3-5.8°. Turn the N-2 gyro unit in pitch through an angle

of 5° in the opposite direction. The elevator must deflect

through an angle of 4.3-5.6° in the opposite side.

NOTE: If the elevator deflection does not meet the required value, adjust theostat No.5 connected in the pitch free gyre circuit. It is permitted to adjust rheestat No.5 within the range of 115±11.5 ohms.

Check the ailerons transmission ratio as follows:

After sending the "UNCAGING" command, turn the L-C gyro unit in roll through an angle of 10° . The alterons must deflect $4.3-5.8^{\circ}$.

furn the N-2 gyrb unit in roll through an angle of 10° in the opposite direction.

The aileron must dediect 4.3-5.8° in the opposite side.

NOTE: If the ailerons deflection does not meet the required value, adjust rheostat No.10 connected in the roll feedback circuit. It is permitted to adjust rheostat No.10 within the range of 100±5 chms

80	Table		
Resis No.	如果是	Fins across which measu- ment is per- formed.	Resistanca ohms
1	iww free gyrd signal cir- cult	31/3-42/2	290 <u>+</u> 29
5	Pitch free gyrc signal	31/22-42/4	115+11.5
10 0 16		35/11-35/13	100 <u>+</u> 5
. Å2 ;:	Bank coordination signal circuit	35/7-35/8	300 <u>+</u> 30

NOTES:

- 4. Theck resistance by a d.c. bridge having the degree of precision not less than 2.5.
- 2. The plug connectors pins are arbitrarily designated: the numerator shows the number of the plug connector and the denominator the number of the plug connector pin.
- 3. Then enecking, connect the plugs to the units mating receptacles. Connect the measuring bridge wires to the pins (sockets) of the plug connected.
- 4. Pins 31/3-42/2; 31/22-42/4 refer to H-2 gyro unit and are manufactured according to a special order with connector plug No.42. Measure resistors 3,5 of the production units cross their contacts.
- 7. After replacing the 1-4 unit or 11-1100 component (or 1) relatized relay in this component) check as outlined in par. 6 (steps 3-6) and check transmission rutio of the corresponding channel of the autopilot as described in step 6, this paragraph)
- 8. After replacing the H-10MO timer check as indicated in step 8, par. 8 (when storing the H-18MO timer in the missile) or as in step 17, par. 6 (when storing the timer in a packing case).
- 9. After repl cing the H-1 control panel, check as outling ed in steps 2-5. per. a(when storing the panel in the missile) or as in steps 13-14, par. 6(when storing the panel in a packing case).

- relay in this H 2 give soil are replaced, check as specified in steps 7.40 and 11, park 8 (when storing all the autopilot units installed in the autopilot of with the Heiggrounit removed from the mosaile) or as in Steps 16,49 am 20 park 6 (when ottoring the subspilled units in placking cased).

 11. The replacing the subspilled units in placking cased).

 the H-1 give up 1, eneck as inscented in steps 5,7-12, perk 6 (when ottoring all the autopilled units inscelled in the slare missile as a factoring all the autopilled units inscelled in the slare missile as a factoring and the autopilled units inscelled in the slare missile as a factoring and the autopilled units inscelled in the slare which is a factoring the capability of as in top 10, 10-11, care which are shown at a step 1, this paragraph.
- unit, who are the restriction to the "20" missile or with the "41 unit the second the missile of with the "41 unit the second the missile of the unit the second the unit the unit the second the unit the unit the second the unitation of an include and and the aircraft the unitation of unitation ratio as indicated in the f, this paragraph.
- unit, short as quality on step to semponent in the T-1 gyro unit, short as quality on step to same w (when storing all the autority) of the installed on the missile or with the H-1 gyro unit to move from the storing of as is step 15, par. 6 (when storing the autopillal units in packing cases).
- the effect ereclescrip brimming rescripto No.3,5,10 and 12, check the typeculasion rails of the corresponding channel as outlined in top Appending 12.

type Winners and the control of the

effect the second of the second custom is an interest of the content of the conte

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private and the second of the

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THE THE PARTY OF THE STATE OF THE

· OF THE COURT OF THE ANGLES APPROPRIES

- 1. Arter's reperties enough of the All-Blautopilot during the per-1's this properation as outlined below, bear in mind that:
- a) the storile to stored installed), the "Yes missile must not be stop to a for religiously checks;
- being removed from the transmitted proliminarily checks, a constitute of the time of the previous periods periods and the previous periods.
- the autopilat which the anerticle is the mission.
- n. Tribago indas, posso das recondencios de la reconsidera del reconsidera de la reconsidera de la reconsidera de la reconsidera del reconsidera de la rec
- 3. Seriest (lug commenter No.16 of the errors that there centred time) will the censesting of the value of the interfact them changed the connecting cable to the charity carrier panel through the secretific cable to the charity carrier tag species (lug connector No.12, having discussed this tag species (lug connector from the N4-45) unit.

THE REPORT OF THE PROPERTY OF of 100401 1 111111 The first war will be sufficient to the same of the sa ence the control of t comment of the state of the properties of 21.. రైజులు కార్యమ్మం కార్ట్ కార్ట్ ఉంది. మందర్ కార్లు ఉంది. మందర్ కార్లు ఉంది. మందర్ కార్లు ఉంది. మందర్ కార్ postilin and the second of the second o and the second of the second o Bug 1 E Commence of the state o The state of the s and the state of t the property of the second sec , the steel of the many leading the 4 to the state of th ailercha and the lates of the same of in the state of th romage.

APPENDED TO A CONTRACTOR OF THE CONTRACTOR OF TH

- 1 sec.

The first of the company of the control of the cont

- 3. If two stem-watches are available, check the program at a single switching-on of the 10-1000 times.
- 4. Thank as outlined in this step and step 11, this corregrain current the first leadings after the nutorilet is 45.
- be non-coording and temperature valow to, the clevester and return to the milital mosetion has real after the "1-20% TYTE betten is reasod.

right affords such the standard wine to the right. The right affords such the standard was lacked the missale to the left. In right eller is such address uponet the right for the original fourities as this case, includered but to set in the resting most tien.

panel. The Tolly is No. 12 to range light that come co. Then the come of the composite the c

Turn to it was in the small on the panel. The elevator much deflice. It is a faile of the anal in the zero position, the elevator much nove to the neutral position. Separation with the mail with the mail wife and turned in the opposite direction.

Mill: Time, required for sential a signal of our polarity, must not enders to esponds.

10. witch on the first we not explicit on the panel. The "COMMAN No.2" warning light must come or. Theck how the control surfaces are controlled by the cultivate are independent pre-set units on the panel in the same way on when sensing commans No.1: in this case when patting the TAUS by and "BLUVAPOR" knobs in the paper positions, the control surfaces and allerons must not reflect to the neutral position, bet the "POWER", "CONTAGE Ro.1" and "TAUS" he.2" switches on the panel in the mark conting.

11. Using the though switch on the jet control famel cut off pages are by the a chort time. The rest is warning light must have on. The control surpasses and silvents must occur, the neutral position and the second rest warning light must become illustrated.

From the TUNISHE' button on the control casel. The Time is acquired tight must go one. There is minutes check the free gyros production. The tyron rigidity must be to that the control carfands suffication for a minutes would not be reed:

round r & 1. Chi

elevator in and

a Lerons + 1.250.

Note: "Allowing delication also depends on the just recommend to a present the contraction of the total problem by from the contraction intentionater. Therefore, cornection as well the place or consider, which in the contraction and the first tent of the contraction and the first tent of the contraction and the contraction a

after that quickly remove the control signal. In this pare the deflection of afterons from the neutral position will correspond to the roll gyro archersion.

12. But the "For A" switch on the descent panel in the "OFF" portaion. issuance the ground test control panel from plug connectors No.36 nd 42.

Connect the missible wiring system plug connector Ro.42 to the Pit-110 unit.

Le-energine to wiss the electrical system.

47. PEPRING TO J. TO TOTAL ALV—AB LONGLED TO ALE TO SERVICE

which the control of the point one suggest power of the \pm 3.5 \pm 3.5 \pm 3.5 \pm 3.5 \pm

light on the an educt core on. Init till zero control ourrests are rest to me the invalor to the autopilet foresk by un
ing the Pit-Poi posels.

witch a time of an earth on the but and panel muct the time. The time are a second muct come on.

D. The street of the training the K-40 Chetter in regime

1

when sending the 'Allan' signal, the rudger must deflect to the right of the right alleron - up. then removing the signal the rudger and allerons must make to the neutral position.

then sending the "Life" signal, the cudder must deflect to the left and the right eileron - down. Then removing the signal the runder and allerons must move to the neutral position. Then sending the "UP" signal, the elevator must deflect upward. Then removing the signal, the elevator must move to the zero position.

then results the "Den signal, the elevator must reflect down. In a redeving the rightly, the elevator must move to the zero position.

NoTh: "the, required for sampling a signal of one polarity must hat expect it seconds.

the Uping the day of switch on the Ged control panel out off were much for a sport throathe dated of warning light room make one

position and the sentral surfaces are not in the neutral position and the A. T. . As wereing light becomes illuminate net the file and region on the page control panel in the FOFF? position.

5. Send commons To.E from the E-th station. The 'Collision's No.2" warning light on the panel most come on last till zero control currents are supplied from the station to the sate-pilet.

The "CAGAL" and "BARN STRON" warning lights on the pench must come on. When 3 minutes press the "WYCAGING" button.

Send control signals in regime " To from the K-1M startion to the autophiot.

The direction of the control serfaces deflection must be the same as in step 3. When removing control signals the control surfaces must be move to the neutral position.

6. It mergize the auto, flot as indicated in step 4. Pisconsect the ground test sontrol panel from plug connector No.36.

ragion t

AUX-50 AUXIMINE PLAT BEFORE & SAUN-OFF

- 18. VERSING FRO ADJUDES AUTOPIDOT BY USING THE CARRIER-
- 1. Johnson the ground test control panel plug connector No.36 to the autopilet board check plug connector No.36 through the connecting cable.

chick that the Transfer suitones on the per control panel and 11-132 unit are in the "The" position.

- P. Janich on the "APATTM FESTIAN and TAP AND E-1" switches on the beabardier centres panel in the front cabin. The "APATT F-1 THRESTELL warning light on the bembardier's panel comes of.
- 5. Therk the autorilet operation using the ground test control panel:
- a) switch on the CPOURT switch on the H-T control panel. The "CROMD" and "BASAN ZERG" warning lights on the panel must come on.
- b) after 3 minutes, press the "UNCAGING" button on the panel.

The "CAGNU" warning light must go out.

Fresh the * N-TOMO STEET* button on the panel and keep it preshed for 5-10 seconds. The elevator must deflect 9-9.5° up from the initial position (12-12.5° up from the geometric neutral position). Fait, till the elevator returns to the initial position.

- c) switch on the "The 1" switch on the penel. Send the control signals by lumning the "Planck" and "Blank From pre-set units knobs. Two senging the direction signal the rudger and allowed mast suffect our when sending the pitch signal the elevator and deflect. At the "it "but switch on the panel in the "Syna position.
- off power supply for a short time. The 1000 of warning light must come on. n.t, till the control surfaces and address are set in the neveral scritting and the "BODIS SLAD" warning light comes on.
 - 4. The formula the judge runal signals and object the authorited promotion by the instruments in the France energy
- warning I and the the company of the most be illustrated and the real and pirel to depress coincurs must be in the stable positional coincurs and the in the stable positional coincurs and the last the last continues and the last the factor of the field coincide to the last cotton wars the last pre-set with known own, it is indicated printer on the life, punch must deficat story and extending printer on the life, punch must deficat

Tress the confidence entire, the "U.D.C.D' warning light or the benchmarked contact panel must come in and the "The missile about the test of the from the initial goal-tion, forests the could raise of the election engle.

her the presset will shot on the Mess panel in the zero nesition.

Twiton off and affect 9-10 seconds withs on the "A" and L-19 switch on the combantaces control and.

The "l.i. WOLGER warming light wast go out. The "B.SES ZARO" warming light on the 12-17% panel must be illuminated.

Repeat the calibration with the pre-set unit knob turned $3^{\circ}, 4^{\circ}, 6^{\circ}$ FORE, and then "UP" for each value indicated by the pre-set unit; the elevator must respectively deflect "indicated by the "UP" with a tolerance of 400. for the value indicated by the pre-set unit.

NOTE: Then calibrating the angles of 3°, 4°, 6° (unlike 5°) the Thin. I put appraise light must go out.

Calibrate the left suspension in the similar vac.

the panel pro-security there.

by theck the elevator of Testira angles caused by the Ti-s panel regards as such that in the Eq. (b), this section with the present and reach turner $\frac{10}{2}$, 3^{1} , L^{2} , L^{3} of the angle of 10 and weight to the deficienties thant.

In this case the effection objects the values given in the calibation character in the calibation character in the caliba

- required and to be the currier-directit erow in precidings with the filter operating instructions.
- Press the TUNCACING button on the bembardier's control panel. The T. P. Undid " warning light must come on.

process the 1 Parison cases button on the bombaroler's panel and keep it processed for 2-10 seconds. The "PRTCH" indicator pointer or the 2 Parison must sharply deflect. After the

program is completed this cointer must return to the zero position.

- e) Switch off and on the "a.r. and d-1" switch on the bombarater's control panel. The "BAJES ZERO" warning light on the AB-TAM panel must be illuminated.
- 5. Set the "SYMMMM PORDE" and "L.F. and K-4" switches on the bomburgiar's central panel in the 'DPF' position.

The "1.P. and E-1" FNARO 12000 warning lights on the bombaroicr's control panel and the "B. : ERRO" on the panel must go out.

Set the "PONIP" and the the introl panel in the "OPP" position.

bisconnect the ground most or arrol panel from plug connector No.36.

for latting a flight, set the "FOWGR" switch on the Jag control punel in the "G" position and men close the locens door.

program to completed this coincer must be the zero position.

- e) Switch off of por the "... and 1-1" switch on the bombarader's control panel. When a UNCASES" light must go out. The "BA'SS ZERO" worming light on the and ye peach must be illuminated.
- 5. Let the "NYEFF" DOL" " and ".... and K-1" switches on the Lombardier's control panel in the TUPS, position.

The "A.R. and F-th PMAR 1845" warning lights on the bombardier's control samel and the "B. 18 8480" on the panel must go out.

bet the "PRELIE owild, on the E-I control panel in the "OPE" justition.

Disconnect the ground west control panel from plug connector No.36.

control panel in the """ position and man close the oceas door.

19.

SECTION VI

ATK-5B AUTOPILOT PERIODIC MAINTENANCE OPERATIONS

ATK-5B AUTOPILOT PERIODIC MAINTENANCE OPERATIONS

PROCLIUPES

- 1. The autopilot maintenance operations are periodic checks of the All-Mautopilot units condition which are performed to determine the autopilots serviceability for operation and further storage and also to prepare them so that they would meet the specifications.
- 2. The periodic maintenance operations are performed by the using organization mechanical personnel of the corresponding speciality.

The record of the periodic maintenance operations is made by the organization engineer or senior technician in the special Log Book or certificates for the autopilot units and set.

NOTE: The form of the periodic maintenance operation Log Book must correspond to the Aircraft Maintenance Manual.

3. The periodic maintenance operations are scheduled to the period of periodic inspections performed as outlined in paragraph 11, these Instructions.

PERSONAL PROPERTY AND A CONTROL OF EXALTIONS RECORD

Nos.

2.

Devices, Tools, materials

Visually inspect all the autorilot 1. units. Nake sure that the external sirrer, rags. surfaces of the units and mountings are from from domages. Demove duct and dirt from the units external surfaces.

Portable lamp,

Il corresion is detected proceed as cutlined in step 7, this paragraph.

emove the lower cover of the TLA gyro unit and inspect the windings of the trimming rheastats on the unit mountaing for condition. If porresion (green coating) is found on the rhiostat winding surface, proceed as apocified in about 8. this paragraph.

lisconnect the units plug connectors, Inspect the plug connector plas. If the pins contacting surfaces are dirty, clean them with a bristle brush slightly campened with 7-70 gusoline and blos with compresses air at a pressure of 1-2 atm. Jonnect and safety the plug connectors.

-70 gasoline, hair brush. Nos. specitions lerformed

hollers.

Nevines, Tools, mate-

70 11 1 15

paper.

Nest Ju-

Della.

etrum ots

Shows the end cap from the BALLSA Э. rear end housing as embly and take out 2-70 gasoline. the brighes from the bruch holders. Inspect Rags #00% ound the commutator curious, If the commutator is burnt, size it did clean rage slightly dampered with ATC gaseline and elean the communitier with the search paper. Back to the law room ormicas length. Brushes form to is one we have read by regiment with noncaes. Inc all the tru has in the brush

close the invertor roun end housing assembly with the end was,

- Terfore the queretions outlined in step 3 on the other far-il inverter, interporated in the materials set.
- These she autopilet unies and bet us 5. specified in: puragraph 12 - onen atoring the Alberta auto ilot installed in the "Kd"mitgile. paragraph 15 - don storing the Ald-13 autopiles with form units removed from the "EC" missile.

paragraph to - when everting the Albert subspilled in the posking cases.

Levines, Nos. specutions Performed Tools, materials leneve the end cap from the MILIA 3. Town Hit rear ent housing assembly and test out 1-70 gasoline. the bruthes from the bruth holders. Inspect និងក្នុន *00° នេះជាជំ the commutator curface. If the commutator paper. is burnt, the is with clien regularizatly aumpined with 400 gustline and clean the commutator with the hand paper, seeming the inverter brunnes length. Spushes form to to make or less room be an large with new vall. Install the truthes in the green hollers. clase the inverter rear end housing assembly with the end days Parthrolds extrations oadlined in secol on the other TATAL invertor, in erporates in the sub-distret. 5. Them the sutopilot units and but us Mest obstrumesis specified int puragraph 12 - whin storing the Albrich 1. 1. 0 auto ilot installed in the "Wilmig ile. paragraph is a with starting the ANGEN autopiles with some raits removed from the HERM missiles paragrain to a then storing the efficient

entopilet in the proking cares.

Nos.

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Devices, Tools, materials

paper.

eneve the end cap from the Think rear end housing assembly and take out 2-70 gasoline. the bruthes from the brush holders. Inspect dags *00* sand the commutator surface. If the commutator is burnt, wife it such clean rage slightly damperon with 270 gastline and clear the communator with the sand paper. seasons the taverter cruches longth. Spushes sorn to 40 mm. or less rout by rejudence with new ca-s. Install the brukes in the brosh hollers.

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- Partern the epocations outlined in step 3 or the other "A"- "A" inverter, in torporuta: in the agter flot set.
- These the nutopilet units and bet as straified in: puragraph 12 - enum atoring the Alberth out flot installed in the "DJ missile. paragraph to some storing the Mid-Aloutspiles of the second mitte removed from the aver aissile.

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Nos. Operations Performed

Devices. Tools, materials

Tool kit

B-70 gasoline.

Rags *00* sand

paper.

Test In-

. 66.

Remove the end cap from the WALLEA 3. rear end housing assembly and take out the brushes from the brush holders. Inspect the commutator surface. If the commutator is burnt, wipe it with clean rags slightly dampened with 1-70 gaseline and clean the commutator with "00" sand paper. Weasure the inverter brushes length. Brushes worn to 10 mm. or less must be replaced with new ones. Install the brushes in the brush holders.

Close the inverter rear end housing assembly with the end cap.

- Parform the quarations outlined in step 3 on the other [47-744 inverter, incorporates in the subspillet set.
- Check the autopilot units and set as struments sproified in: paragraph 12 - when storing the Alle-5B authoria installed in the "KJ"missile. paragraph 13 - when storing the AN-BB outopiles with come units removed from the "Mar missile.

paragraph to - vice storing the Allina sutchilot in the packing cases.

Nos. Operations Performed

Devices, Tools, materials

Tool kit

paper.

Remove the end cap from the HALLIGA rear end housing assembly and take out - F-70 gasoline. the brushes from the brush holders. Inspect Rags "00" sand the commutator surface. If the commutator is burnt, sipe it with clean rags slightly aumpened with 1270 gaseline and clean the commutator with """ and paper. Measure the inverter brushes length. Brushes worm to 10 mm. or less must be replaced with new ones. Install the brushes in the brush holders.

close the inverter rear end housing assembly with the end cap.

- Perform the operations outlined in step 3 on the other TAY-TG1 inverter, incorporated in the autopillot set.
- Theor the autopilot units and set as specified int paragraph 12 - when storing the ALM-5B autopilot installed in the "KC"missile. paragraph 13 - when storing the ANA-5B autopilet with some units removed from the "EC" missile.

paragraph 10 - when storing the ARE-SE autopilot in the packing cases.

Test In-

struments

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Nos. Operations Terformed

Devices Tools, mate rials

Tool kit

paper.

Remove the end cap from the MAP-IQA 3. rear end housing assembly and take out B-70 gasoline. the brushes from the brush holders. Inspect Rags "00" sand the commutator surface. If the commutator is burnt, wipe it with clean rags slightly dampened with 5-70 gascline and clean the commutator with "00" sand paper. Measure the inverter brushes length. Brushes worn to 10 mm. or less must be replaced with new ones. Install the brushes in the brush holders.

Close the inverter rear end housing assembly with the end cap.

- Perform the operations outlined in step 3 on the other MAI-ITA inverter, incorporated in the autopilot set.
- Check the autopilot units and set as specified in: paragraph 12 - when storing the AHR-5B autopilot installed in the "KC"missile. paragraph 13 - when storing the ANK-5B autopilot with some units removed from the "KC" missile.

paragraph 14 - when storing the AIIK-5B autopilot in the packing cases.

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paragraph 12 - when storing the ANK-5B	** Set.
autopilot installed in the "KC"missile.	
paragraph 13 - when storing the AIII-5B	
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"KC" missile. paragraph 14 - when storing the ANK-5B	ny t
autopilot in the packing cases.	

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Operations Performed

Devices, Tools, materials

rear end housing assembly and take out the brushes from the brush holders. Inspect the commutator surface. If the commutator is burnt, wipe it with clean rags slightly dampened with 5-70 gascline and clean the commutator with "00" sand paper. Measure the inverter brushes length. Brushes worn to 10 mm. or less must be replaced with new ones. Install the brushes in the brush holders.

Close the inverter rear end housing assembly with the end cap.

- en the other FAT-IIA inverter, incorporated in the autopilot set.
- 5. Check the autopilot units and set as specified in:
 paragraph 12 when storing the AUK-5B autopilot installed in the "KC"missile.
 paragraph 13 when storing the AUK-5B autopilot with some units removed from the "KC" missile.

paragraph 14 - when storing the AIK-5B autopilot in the packing cases.

B-70 gasoline

Tool kit

Rags "00" sand

paper.

Test Instruments

Set.

Nos.

Operations Performed

Devices, Tools, materials

Tool kit

B-70 gasoline:

Rags "00" sand

paper.

rear end housing assembly and take out the brushes from the brush holders. Inspect the commutator surface. If the commutator is burnt, wipe it with clean rags slightly dampened with 5-70 gasoline and clean the commutator with "00" sand paper. Measure the inverter brushes length. Brushes worn to 10 mm. or less must be replaced with new ence. Install the brushes in the brush holders.

Close the inverter rear end housing assembly with the end cap.

- on the other RAF-ITA inverter, incorporated in the autopilot set.
- specified in:

 paragraph 12 when storing the ANK-5B

 autopilot installed in the "KC"missile.

 paragraph 13 when storing the ANK-5B

 autopilet with some units removed from the

 "KC" missile.

paragraph 14 - when storing the ANK-58 autopilot in the packing cases.

Test In-

Set.

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- c) perform the operations outlined in otops had not not on the life.
- o) unscrew a serew attaching the gram of about the read hear-head series to chirg the Tan assembly can be cover the Tan assembly and the support (plate, District of 1).
- e) clear the 12 massembly came, bill a cold target is indicated in steps 32" and "b":
- install the Fiel and then be assembly in place and scoure them by attaching screws placing split washers under the screw heads.

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- outlined in step 4, when perform the operations outlined in step 4, when performing every month maintenance operations on the missile.
- To distribute the operations described to recognize 15,00, the I-T and U-, units must be closed with the covers are secured with seems of the using organization. The limit Clark guarantee will remain valid.

SUSTION VII

ATTE-51 ADDRESS OF THE POPULS OF

21. Mil-56 AUTOFILOR THE SEAS AGUITATION

- 1. The Allh-Eductorilet combined checkout in the eyer missile with the H-1 gard unit removed from the missile and also the autopilet chackout on the test stand is performed by means of the test equipment set.
- 2. Sheck the AFE-TP autopilet installed in the Parmissile by means of the CHE ground test control punct.
- 3. Whe set of the test equipment (ewg.379.00.00.000) incorporates:

III-1 control panel - 1

WA-2 rounting -1

KHA-2 simulator = 3

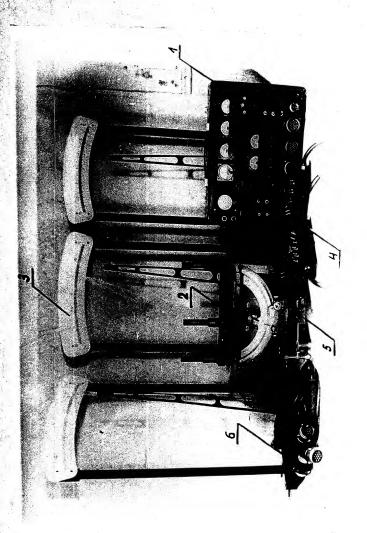
IIIA-5 Junction ben - 3

Connecting cables - ! set.

Neggis show shouking the following autopilot installed an the missile, the close to not used.

junction bases are not used.

- the best equipment of is shown in Fig. 48.



control panel; 2 - MIA-2 mounting; 3 - MIA-3 simulator; 4 - MIA-4 junction box; Fig. 12. Test Equipment Set.

Shock-mounted to the control panel casing is the face panel castrying all the control panel electrical units and the clock showing the time curing which the autopilot is energized. The clock is started by a special electromagnetic relay built-in the control panel which is actuated whenever the autopilot is energized.

The autopilot supplies D.C. power of 26 V to plug connector No.43 to feed the control panel circuits. The panel is provided with a special "POWER SELECTOR SWITCH" used to change the modes of the control panel functioning; with the "POWER SELECTOR SWITCH" in the "BOARD CHECK" rosition, the autopilot is checked via the board check plug connector, and with the switch in the "AR-ITM SIMULATOR" position, the autopilot check is simulated by means of the AR-ITM panel of the carrier-aircraft and with the switch in the "R-100 panel of the carrier-aircraft and with the switch in the "R-100 panel of the sation is sumulated.

The KNA-I control panel schematic diagram is given in Fig. 13.

The control panel operating temperature range:

- a) control panel with test instruments model into an analytic dwg.3790100000) 20°C to +50°C.
- b) control panel with test instruments movel M5-2 (dwg. $33700000000) = 35^{\circ}$ C to $+50^{\circ}$ C.

NOTE: When operating at a temperature below more do not use the clock of the panel (dwg.37951.00.560); when operating the panel (dwg.3375000555) closs and *CLOCK HEAT" switch.

mounting (dwg.3790200000) is intended for extending the N-2 girs unit to the NHA-5 turn table. The i-2 girs unit is sefured on three steel posts scread in the mounting atta hment holes are displaced from the line of symmetry to shift the C.G. position or the 2 girs unit together with the mounting from the turn table.

This shift is made to prevent the turn table plays from elfecting the accuracy of the turning angles measurement.

The mounting weight is not more than 8.5 kg.

to indicate the E-4 servo units outlet shafts turning angles when checking the autopilot on the stand.

The simulator scale is graduated from 0 to ±15°. Such degree division is divided into 10 parts i.e. the scale division value is equal to 6 minutes of arc. The angles are indicated by the pointer attached to the outlet shaft of the R-4. servo unit to be checked. The simulator weight is not more than 7.2 kg.

hected to the autopilet circuit when enecking the autopilet on the stand to permit switching-on and checking of the N-4 serve units various control circuits. The junction bear weight does not exceed 1 kg. The junction box schematic diagram is given in Fig. 14.

XPA-5 turn table (dwg.379.05.00.000) is designed to set the H-2 gyro unit angle of turn about 3 mutually perpendicular axes. Angles of the table turn (see Fig.15):

renal/report there is a few turn cable are

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energy presentions periodes its follows:

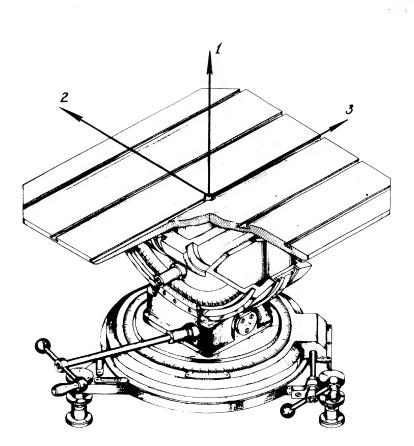
the a once is month thoroughly wipe (without disassembling) the frietheral surfaces of the lower and upper semi-cylinders with a light country of OKE 127 lubricant;

b) adjust the angular play by means of eccentric bearing; and locking screws.

The turn table weight is not more than 21 kg.

connecting cables (dwg.379.06.00.000) are intended to connect the autopilot units when checking the autopilot on the stand and to connect the N-Z gyro unit, removed from the missile, to the missile wiring system and KNA-I control panel when checking the autopilot in the missile.

... incorporated in the test equipment set are 12 connecting



Edg. 15. Kla-3 Turn Talle ves Fig. ras.

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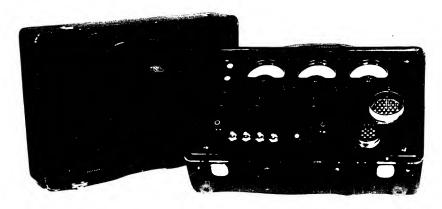


Fig. 16. IHK Ground Test Control Panel

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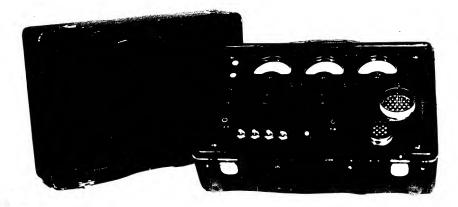
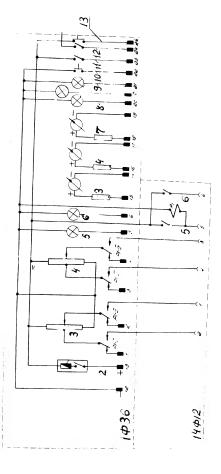


Fig. 16. IHK Ground Test Control Fanel



1) Board check. 2) Power. 1) Yaw 4) Pirch. 5) Command No. 1. 6) Command No. 2. 1) Roll. 8) Base's zero, 9) Caged, willincaging, m) Check, will mergency. 4)KI-13M unit Simulator. 14/11-18MO STANT.

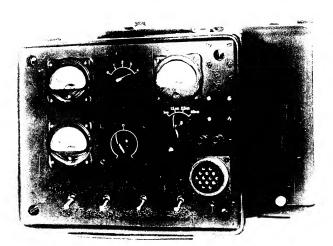
16) Control sertaces position indicators (1-0-1MA)

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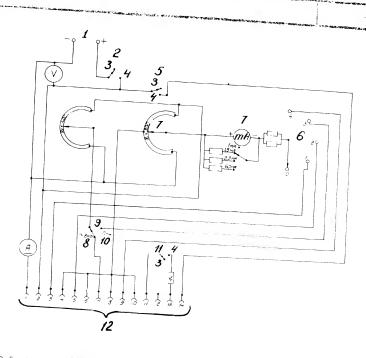
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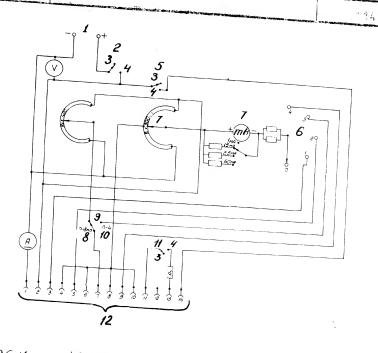


Pig. 18. MLl Control Conel



DPOWER 26 V. 2 Poston 3) 011 4)00 51/7-18MG STORY 6) Winding selector switch z' Signal 8) 17-18MO timer 9 Panel 10,17-4 SETVO UNIT WFeedback 12) Receptact 13) Key to diagram A-D.C. ommeter with the scale range of 0-10 A, 2.5 degree of precision V-D.C. voltmeter with the scale range of 0-30 V, 3.5 degree of presision MA-milliammerer model M5 2 with the scale range of 1-0-1 with Lu, Lu, Lu, shunts connected, the scales are respectively 15-0-15: 25-0-25, 60-0-50

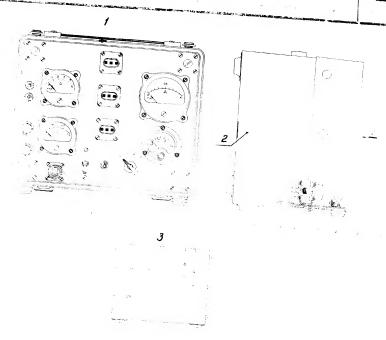
Fig. 19. Fell describition on his time



1) Power 26 V . 2) Power 3) Off 4) On. 51/7-18MO start 6) Winding selector switch 8) 17-18MO timer 7 Signal 10) 17-4 Servo unit g' Panel. WFeedback 12) Receptable 13) Key to diagram A-D.C. ammeter with the scale range of 0-10 A. 2.5 degree of precision voltmeter with the scale range of 0-30 V, V-D.C. 3.5 degree of precision MA-milliammeter model M5-2 with the scale range of 1-0-1 with u, u, u, shunts connected, the scales are respectively 15-0-15: 25-0-25, 60-0-60.

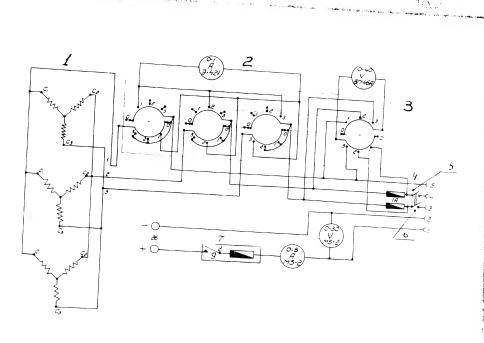
Fig. 19. III-I Control Famel offers a track

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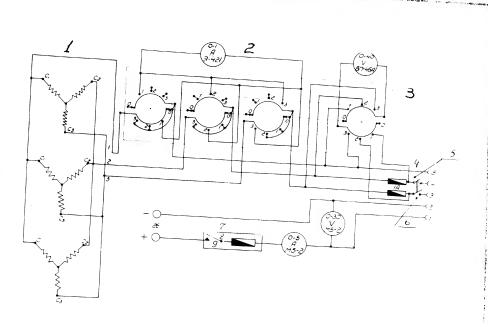
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3) View on arrow A, Scale 1:2

Fig. 20. (U-5 Control Canel



1) Gyromotors No. 488 00 04 060 2) Phase selector switch 3) Selector on the 5786 4) Load 5) Off 6) On 7) Power 8) Off 9) On

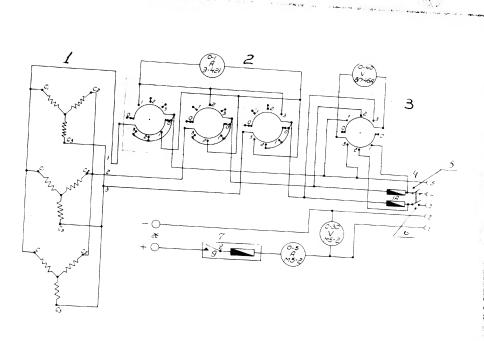
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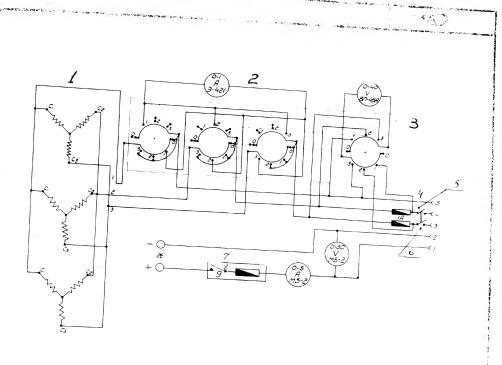
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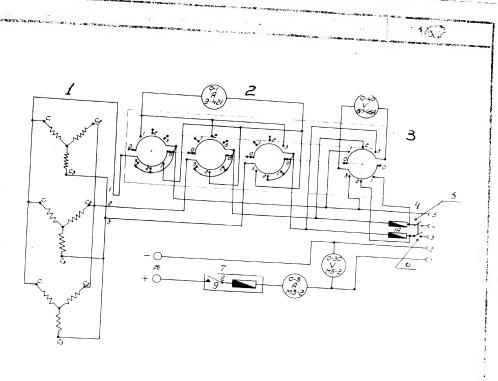
1) Gyromorors No. 584 00 04 069 2) Phase selector switch 3) Selector 24 4ch 5.788 4) Load 5) Off 6) On 7) Power 8) Off 9) On

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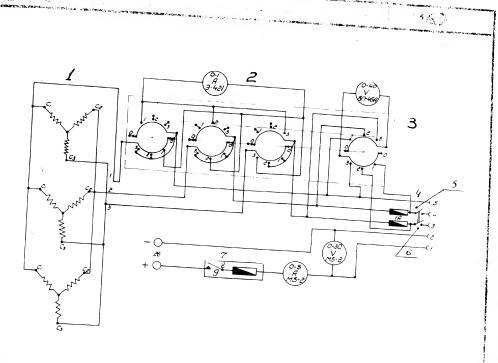
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1) Gyromorors No. 489 00 04 000 2) Phase selector switch 3) Selector switch 5.784 4) Load 5) Off 6) On 7) Power 8) Off 9) On

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2) Phase Selector switch
3) Selector switch 5178H
4) Load
5) Off
6) On
7) Power
8) Off
9) On
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Fig. 21. KH-5 Control Parol DeLemater in process

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d) that a minimum error of the command initiating as the minimum A.C.C. voltage, is no more than \$5% of the established value;

e) when the comment initial into a new for the entries of the comment of the comm

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- B. Unit diverse consult Alle 1 1 1 2 190 mm
- C. Unit weights Jac approprie

1. The elementary a bayen herealistics

The unit "CARD-Is" is a relay levice, which gives away the execution command (+27 v) for missile "NO" self-destroying to the autopitot stovation driver when the Radar A-regime A.G.C. output voltage is less than a precatablished value. The A.G.C. goes through the plug-connection "III -20" pin N 5. When missile "NO" guidance is normal beam-riding, the A.G.C. output voltage, applied to the belanced network, cutsoff the unit from

Ě		*	2											an that the later and the later de late			to parameter be executed.	-	-
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The classics-boxwe cover any 1, 427 a roun through the closed relay P-3 contacts to the intermediate relay P-4, which de-energizes the control colay P-5, and with it disconnects the unit from the control circuit of the

Ра своб.

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accopilet elevation driver. If the missile "KC" goes out from the C-17A bean, the A.G.S. weltage stores decreasing.

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The policy of protects the most of A Maide saif-destroying corner in the case, shen the unit Ki-jap a.G.C. detector tube 5 A -73 as reflective. Then this fact takes place the unit all-jap gives away a voltage approximately equal to -25 r & -30 r, the relay opens its contacts I 2 and I 3, 4130 y is cisconnected from the "memory" circuit and it will produce self-destroying command.

The resistor R6 is netched so, that the relay F2 operates, when the plus 4120 pin 85 voltage is equal to 20 v \pm 2v.

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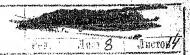
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II. The unit operational instruction

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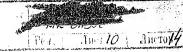
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- by comment the gap, whitever is those 2.5% and so the mange C = 25.2 which is the growth;
- s) switch on the left of the one the angule suggest form
- d) term the mile of \$4.70 The potentium see \$9 and the mensionists of processing to the set will got when it will be done, the wolumntur with indicate voltage at the jack of \$7.10.
- e) ours stouty the per suitometer 29 brob courber-clockwise until the jack "N-F" volvege disappeares:
- f) increase the signal power up to 40 abm; voltage must appear at the jack "[-1" in this case;

and No many armore the state of the partitions and Have Opensepare

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division indicates failure of the contect of the "drop" or "-27 v" network.

- e) release the batton "ROM. N I";
- f) set a simul power equal to -4] dbm; puch the batton "KOM. N T", well d-10 soc., the unit must not produce the dive signal. Allege the beston "KOM. N T":
- g) decrease the input signal does to 45 dbe; push the retired to the retired to the light signal.

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The cheefing should be sured out to the following succession:

- a) the unif is to be elected often overall sumplete system checking:
- b) when the Madars E-IM and K-IIM are switched on win and the Autopilot is catched, the navigator-bombaimer as should push the board "DK-17M" batton "commend N I" and order "Attentions Switch off high voltages" to the mavigator-operator.

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c) measure time interval between the Rador 2-IIE transmitter switching off and the mement of the unit 15 operating Arc. 14" dive signal appearance. When the unit 15 operating normally, the polices of the board "DE-17E" elevator indicator rate deviate to the left at 9 ; 1 divinion in 6 ; 2 see after the rement of the Rador C-IIE transmitter is recting off.

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Handle: Sucrept to me work to vertiles. The portate, which is a report that the properties the control of the following properties with solds, there is end policeous misseunces is prohibited.

2. All the units must be packed, using board boxes (drawing A B N-4-180-015). Boxes, constituing units, usual be a protected with a polychlorovymyl cover and atomet in a packing case (drawing N PR -39-00) in fours in each case.

Kan Bugas Bann but had a Bugas baseling or a Spinarpia



6. Transportation of the units

- To the units are allowed to be transported in the cove-mentioned packing.
- a) by truck:
- max. distance 500 by at a store more than

 kn/hear (nature) roud) and at a speed of 40 km/hour

 (highway).
 - b) by rail, by water and by sing
 - any distance.

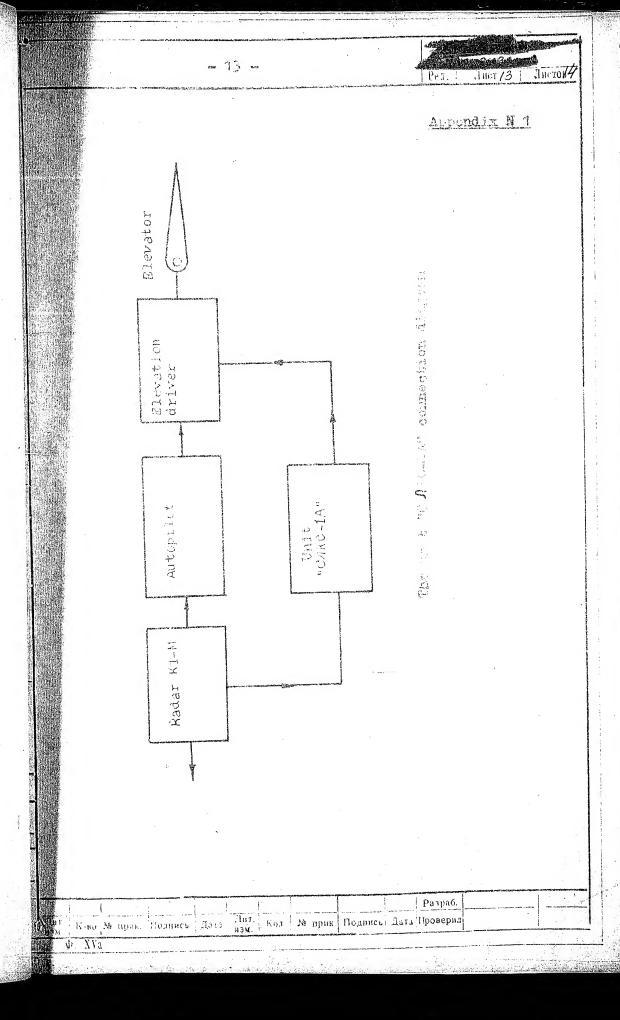
7. Regulation works

- I. Regulation works include:
- a) superficial examination,
- b) electrical parameter checking.
- 2. When the units CAKO-IA are installed in the abjects "KC", the regulation works are to be carried out simulaneously with the regulation works of the object "KC".
- 3. When the units C KG-IA are stored in storehouses the regulation works must be parried out wouthly.

8. Menuinoturer's succented

The manufacturer guarantees 1000 operational cycles during 12 months from the date of arrival in the port of destination.

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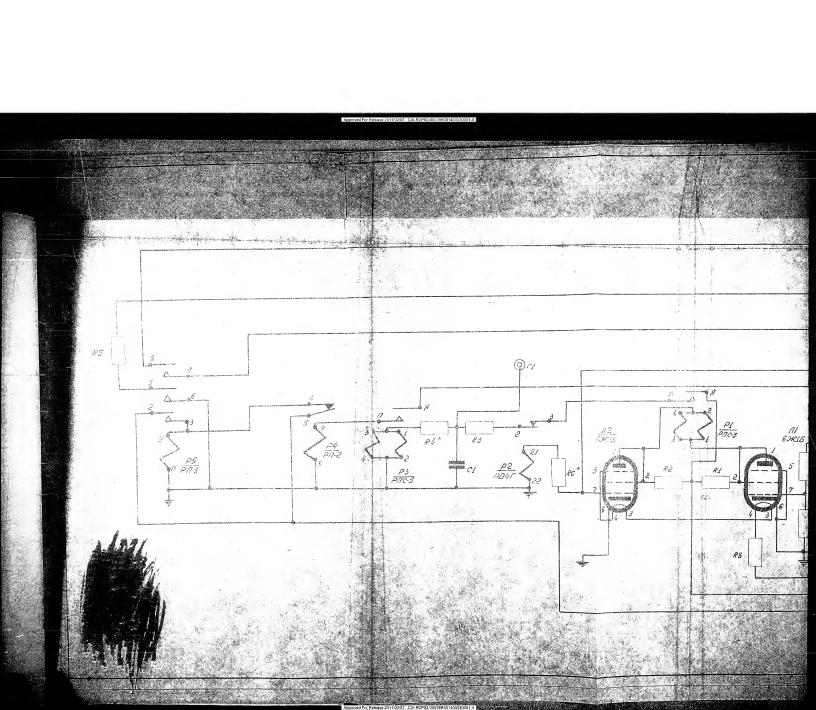


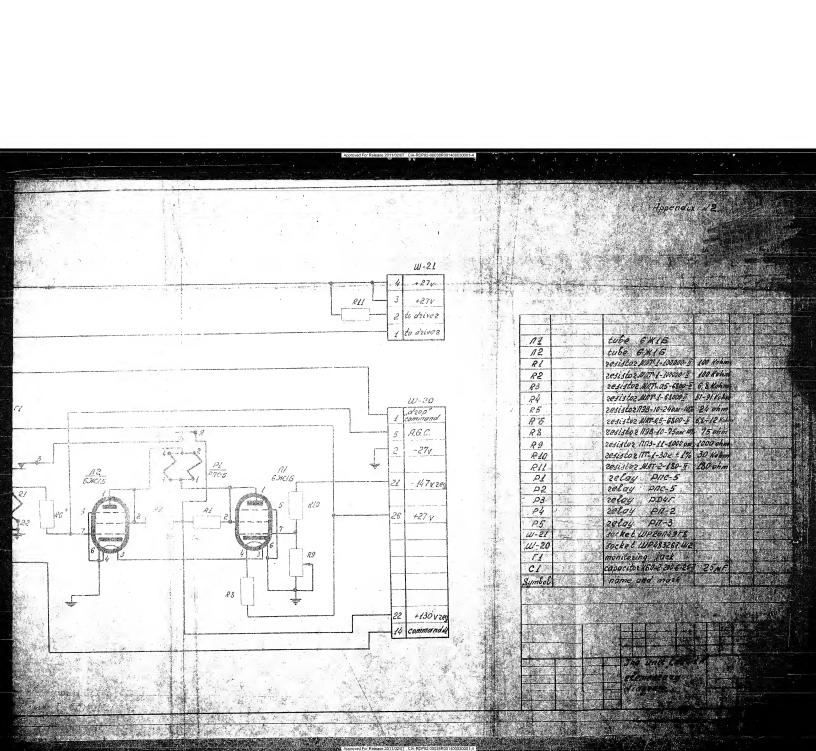
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	2011stoz NAT-0.5-6800-1	6,8 Kohm		
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	28515to21138-10-240A-107	24 ohm		
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	28815602 1138-10-750N 107			
	Zesistoz 17173-11-1000 om.	1000 ohm		
	Zesistoz 177-1-30x ± 1%	30 Kohm		
- Marina an Addison of Congress and Congress	Resistor MAT-2-180-F	180 ohm	Jr	
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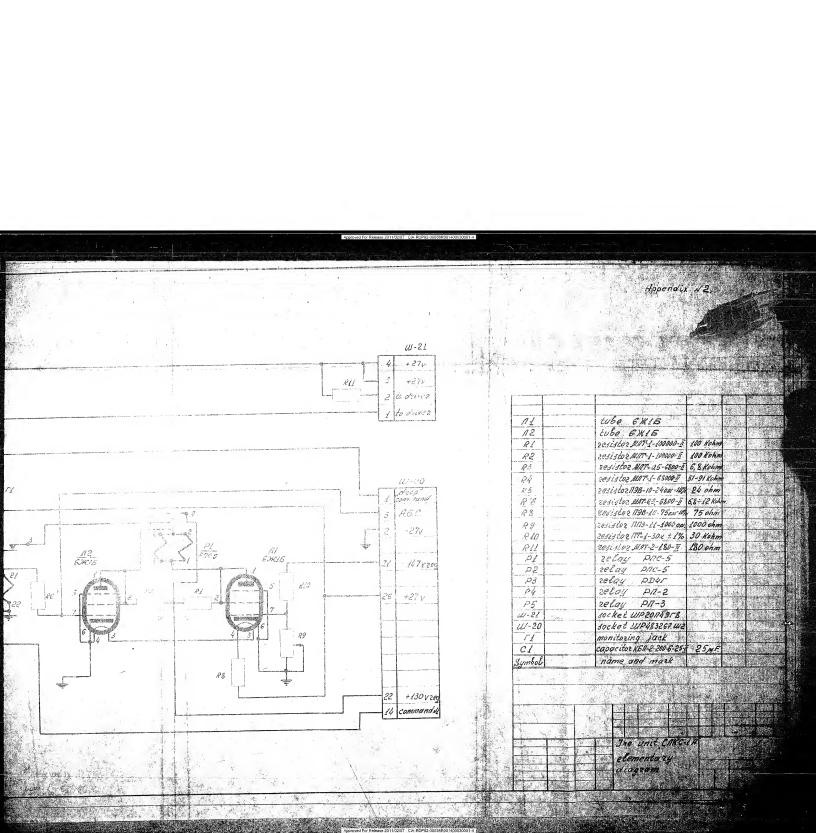
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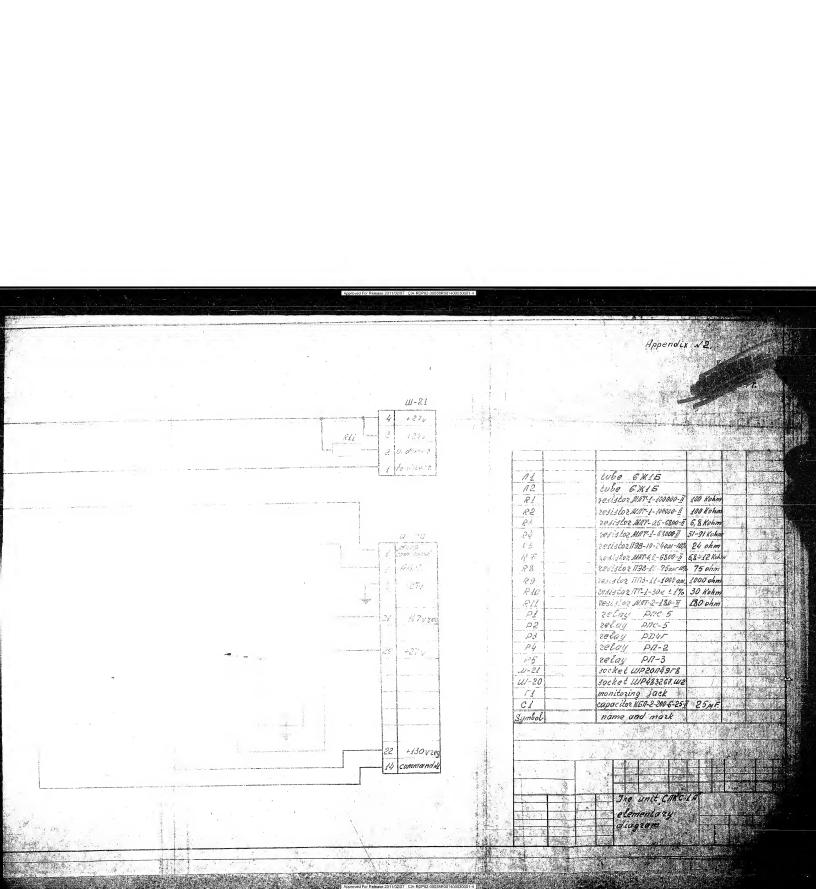
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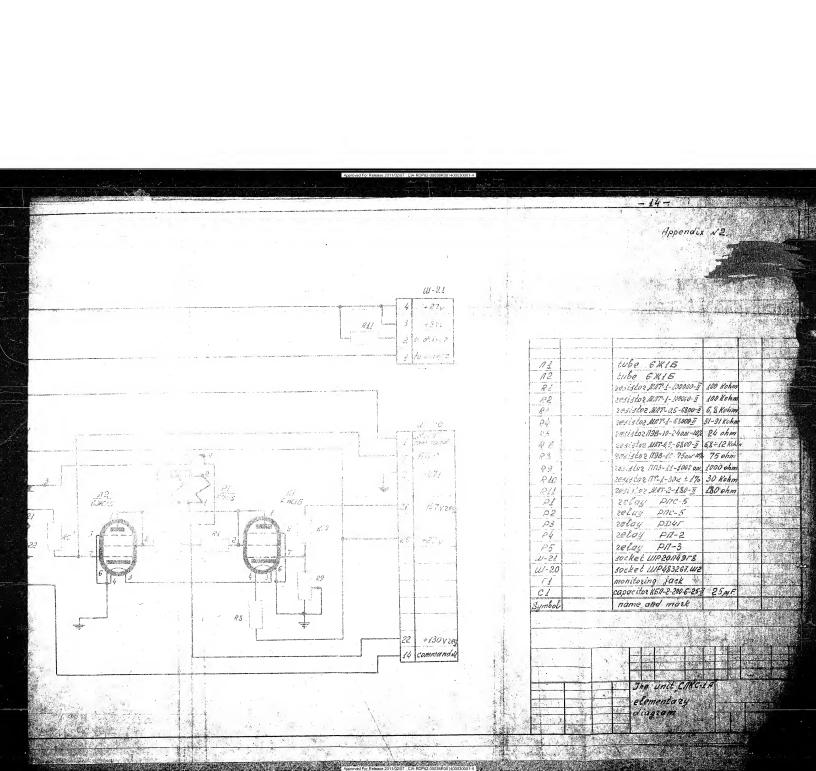
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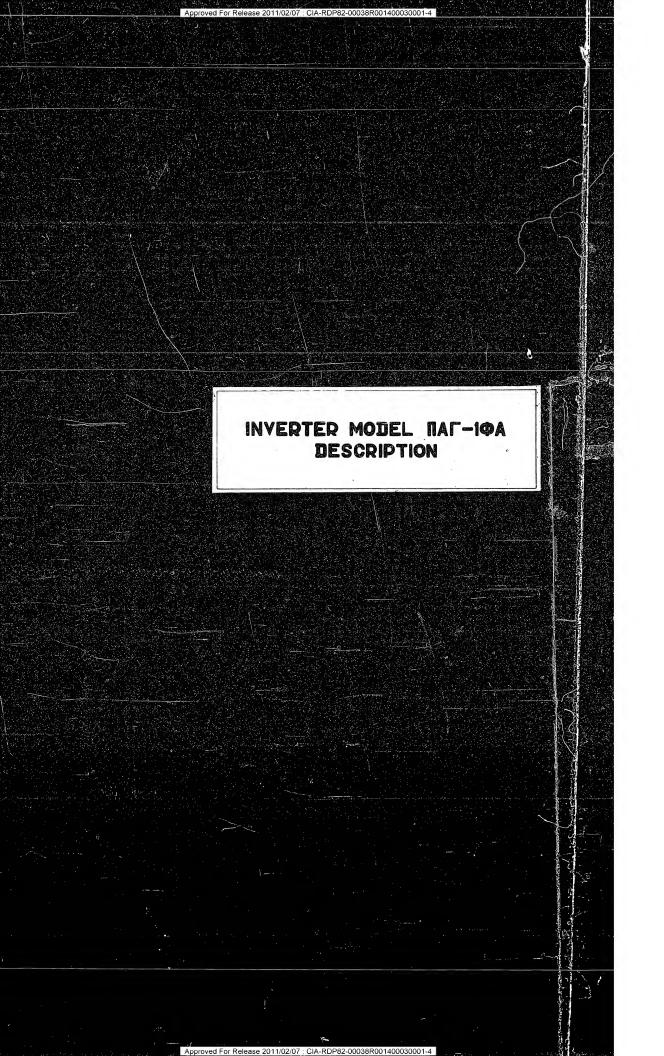












INVERTER, MODEL HAT-IGA

DESCRIPTION

I. GENERAL

The MAT-IDA inverter is designed for feeding special units with a three-phase 400 c.p.s. A.C. and represents a unit consisting of a D.C. motor with compound field winding and a three-phase A.C. generator excited by a rotor permanent magnet.

The inverter is provided with a special filter (see the diagram) used for supressing the inverter radio-noise, the filter consists of three interlocking and one duct capacitors and a choke.

The inverter is connected to the missile electrical system by means of a five-pin plug connector.

The inverter is provided with a built-in adjusting resistor connected in the electric mater shunt winding circuit for maintaining the generator frequency and voltage constant at different ratings.

II. TECHNICAR DAWA

A. FOR THE ELECTRIC MOTOR.

- 1. Terminal voltage 27 ± 10 % V
- 3. No-load current at supply

voltage of 27 V not more than 2.2 A

4.	Speed of	rotation	 	8000+10% r.p.m.	

- 5. Duty continuous
- 6. R.H. direction of rotation

(as viewed from the commutator end)

B. FOR THE GENERATOR:

- 8. Output current not more than 0.51 A
- 9. Power factor 0.65
- 40. Frequency 400 \pm 10% c.p.s.
 - 0. MTO-7 BRUSHES ("7" a specific Mfr's Mark)
- 11. Saze 6.5x7x14 mm.
- 12. Quantity
- 13. Tension on brushes 225±25 gr
 - D. MAGNETO-TYPE BALLBEARINGS No. 6007... 2
 - B. Weight not more than 3.5 kg.

III. INVERTER ELECTRICAL SYSTEM

The inverter wiring schematic diagram is given in Fig. 1.

IV. DESIGN

The inverter is provided with a fan-assisted cooling (Fig.2).

The iron laminations of the electric motor and generator stators are mounted in a common casing (1), cast integral with a support.

The electric motor armature and generator are mounted on a common shaft (2). The electric motor magnet system

s two-pole. The electric motor field coils windings (3) are connected in series.

The end of the series field winding is connected to the positive brush-holder.

The end of the shunt field winding is connected to the regulated adjusting resistor (12) located in the support.

The negative brush-holder wire is directly connected to the plug connector, an the common field winding end-to the plug connector (Fig. 1) via the duct capacitor and the choke mounted on the end nousing assembly (4).

The generator stator winding ends and electric motor filter wires are connected to the plug connector (6) through the holes in the end housing assembly.

The inverter plug connector pins designation corresponds to those in the schematic diagram (Fig. 1).

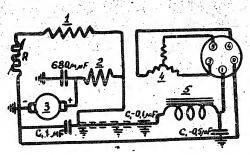
The adjusting resistor (12) mounted in the support is designed for adjusting the ...C. frequency with the inverter operating at a nominal load.

The position of the adjusting resistor sliver in the electric motor shunt winding circuit is set at the Mfr's plant and is unchangeable during operation.

Mounted in the support beside the resistor, is the capacitor (11) connected in the filter circuit. The generator rotor is a permanent magnet made in the form of a six-pointed star.

Brushes are inserted in brass brush-holders mounted on the brush-holders bracket (7) which can be turned for adjustment purpose.

Two openings in the end housing assembly (5) covered with



- 1 Shunt.
- 2 Series.
- 3 Armature.
- 4 Generator.
- 5 Choke

Fig. 1. Inverter Wiring Schematic Diagram

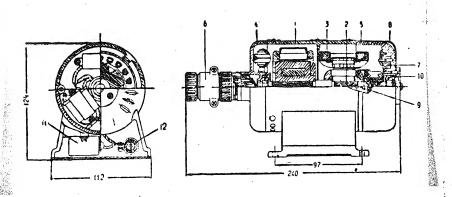


Fig. 2. Inverter Cross-Section View

1 - Casing; 2 - shaft; 3 - field coil; 4 - end housing assembly; 5 - end housing assembly; 6 - plug connector; 7 - brush-holders bracket; 8 - end cap; 9 - stud; 10 - ball-bearing; 11 - capacitor; 12 - resistor.

the end cap (8) permit to inspect brushes with the end cap

The end housing assemblies made of aluminium alloy are stached to the casing by two studs (9).

The armature is mounted on the magneto-type ball-bearings (40) which facilitate the inverter assembly and disassembly. The armature end play is compensated by four cylindrical springs producing an axial pressure on the ball-bearing outer race, from the commutator end.

V. INVERTER PISASSEMBIN AND RE-ASSEMBLY PROCEDURE

After the guaranteed service life has expired, disassemble the inverter when a trouble detected can't be remedied without disassembling the inverter and when it is necessary to replenish the ball-bearings lubricant.

If the generator rotor magnet was removed from the stator assembly it must be magnetized and stabilized at the Mfr's plant. The armature should not be removed from the inverter if unnecessary.

Disassemble the inverter as follows:

- (a) Remove the end cap from the end housing assembly;
- b) Disconnect the brushes and pull them out of the brush-holders;
- c) Disconnect the field winding end from the brush-holder and disconnect the wire leading from the brush-holder to the plug connector;
 - d) Release the studs;

- e) Disconnect the plug connector from the end housing assembly and unsolder the wires from the receptacle pins;
- f) Remove the end housing assembly (5) from the casing; move the end housing assembly (4) 20-30 mm.away from the casing, unsolder the wires from the capacitors and choke, and remove the end housing assembly;
- g) Full the armature of the casing from the generator end.

When pulling the armature out of the casing, tightly enclose the rotor in a steel tube to prevent the permanent magnet demagnetizing.

Re-assemble the inverter reversing the disassembly procedure. In this case dowthe following:

- a) Before re-assembling the inverter, wash the ball-bearings with clean gasoline. Pack the bearings with a limitted quantity of WMATUM_201 lubricant; apply the lubricant only to one side of the ball-bearing so that the lubricant would be flush with the bearing ball;
- b) Insert the brushes into the brush-holders only after the inverter re-assembly is completed to prevent them from being damaged by the commutator butt.

Pay particular attention to proper fitness of the brushes to the commutator surface. Otherwise, fit the brushes to the commutator by using sandpaper 220 (TOCT 3647-47).

If the commutator is burnt, wipe it with a clean cloth slightly dampened with gasoline. Clean the commutator with sandpaper 220 (TOCT 3647-47).

c) Lock all attachment parts in the same way as they were locked before disassembly.

After the inverter reassembly is completed, check the armature for free rotation turning it by hand.

Then rotating, the armature must not contact the poles and the commutator-the brush-holders.

Stiff or unsmooth rotation of the armature may result from misalignments due to a poor re-assembly.

The inverter insulation is tested:

a) on the motor side - by applying 330 volts b.C. for 10 sec. in this case the electrical circuit must be disconnected from the casing by raising the negative brush and Heb-Ada-85-11 resistor clamp;

apply the test voltage as follows:

one cole - to the inverter casing, the other - to the plug
connector contact "i";

b) On the generator end - by applying 500 volts A.C. for 1 min.

Connect the terminals of the power supply source as follows:

one - to the casing, the other - to one of the rlug connector contacts "3", "4", "5".

Check the insulation resistance by using a corresponding megohieter, connecting its terminals in the same way as they were connected when the insulation was tested.

In both cases the insulation resistance must be not less than 5 megohms.

VI. INVERTER INSTALLATION AND OPERATION INSTRUCTIONS

- 1. The inverter is installed in horizontal position, and attached by screws inscrted through the support holes.
 - 2. The inverter is designed for direct connection to the missile electrical system without any starting relays.
 - 3. After the inverter is connected to the missile electivised system, fully tighten the plug connector coupling nut.
 - 4. curing the inverter service, periodically check its brushes and commutator for condition.

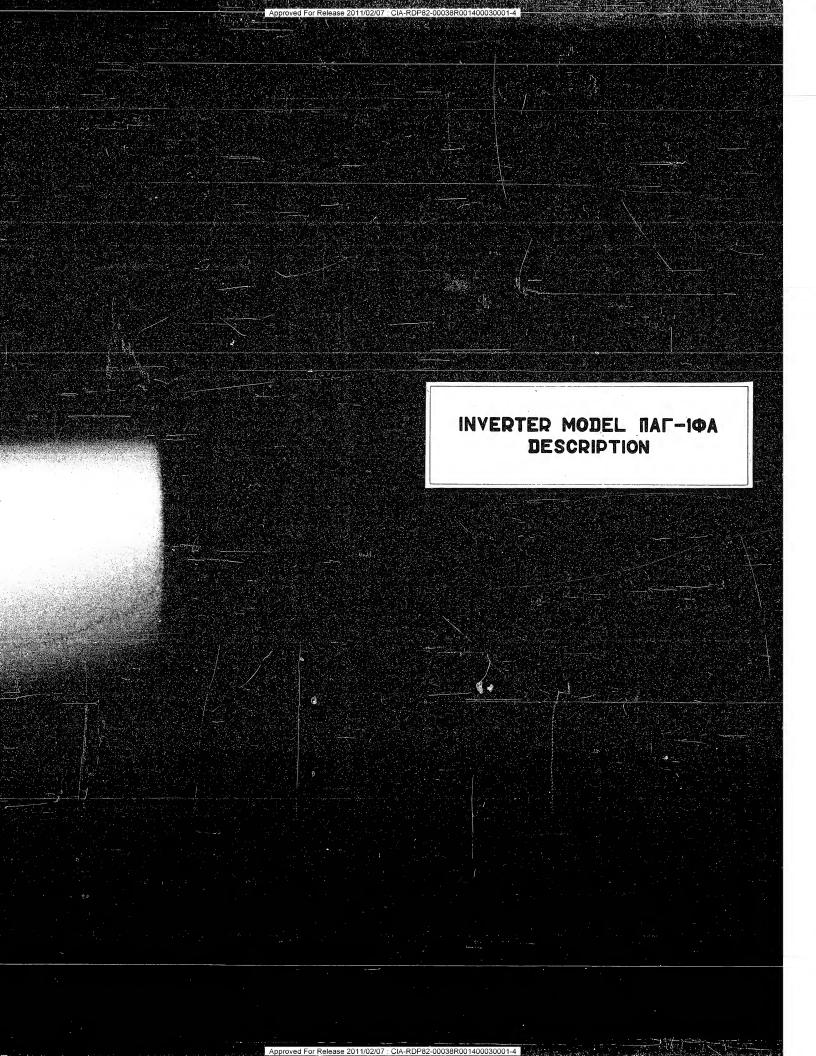
at normal operation the operating surface of the

if the commutator is burnt, where the commutator of collined in Section V.

with the new ones of the same type.

The a.c. wires must be twisted inside the inverter and shielding conduits.

- 5. The inverter operates at:
- a) Altitude above sen level.....up to 15000 m.
- b) Ambient air temperature from -60° to $+50^{\circ}$ C.
- c) Relative humidity up to 98%.



ILLUSTRATED LIST FOR SPI III

ILLUSTRATED

LIST

FOR CROUND EQUIPMENT AND INDIVIDUAL SET



TORIGINATE TO THE PROPERTY OF	Agree Name
OSKION (I)	Front shield.
	1 in set
08H /015	Rear shield.
	1 in set
KC-9710-0	FuseLage front

£ .

Fuselage end.

1 in set.

1 in set.

Cradle bonding strip.
2 in set.

	47.73 27.63	Norrie :
KC 9512:20	totted Ltem	Wing rod- support 2 in set
08KC/054A	2 _ 1	Cover for presenva: tion of item .KC
	1-1.	Cover for front and rear cover of engune 2 in set
KC-9310-0		Hangar trolley 1in set
Apmokyri 4043		Documentation Bag Juniset
MR-SOOM	1-1	Convertor spare parts Iset

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Detail and equipment No	Case No	Norne
1A-550M	1-1	Spare parts for convertor 1 set
K1-M	1-1	Spare parts for each radar station
KP-1	1-1	Starting coil spare parts. 1 set
	1-1	Flectrical actuator. 1 set
630613	1-1	Stopvalve gaskets 2 in set
	1-1	Spare Brush. 4in set
K1-3-0-002	1-1	Wave guide section gasket 5 in set
	11	Brushes for electrical actuator 2 in set
	7-7	Spare parts for generator

Detail and equipment No	Cose No	Name:
		lllistrated list ground eguipment 1 set
	1-1	P.C.V. Bag for cradle attachmen t bolts. Iin set
155H555-5-16-14	1-1	Bolt for Hotch ottochrhent 20 in set
15A49-6 SSD	1-1	Sprnig washer Uin set
KC-7106-102	1-1	Cradle attachment Bolts 2in set
KC-1800-80	1-1	Nut for wing attachment 4 in set
KC-9530-30	1-1	Key for wing attachment. Supplied with each? item KC. 1 in set
KC-7901-3056x	1-1	Weisher for wing pickups. 2 in set

	Cose	
Detail and equipment No	No	Name
291050-2-19-150		Sprnig for wing attachment
	1-1	
7997987		2 in set
155H555-6-16-12		Bolt for hatch attachment
	1-1	
		50 in set
117-10		Delayed action
17-10 (C)		fuse.
	1-1	2in set
KC-6100-18		Ring gasket
		for KC-6100-140
	1-1	valve ring. Sin set
MC-9530-50		Key for cradle
		folts Supplied with
	1-1	each 3 fin set itemko
KC-8400-110		
		Safety-Bar
		extractors
	1-1	1 set
G		Gosket for stop valve
KC-6100-202,	1-1	* for ret

Inspector

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SUPPLEMENT TO INSTRUCTION No.369-N3

INSTRUCTIONS

FOR CHECKING REFERENCE INSTRUMENTS ON PANELS

OF 369 ITEM TEST EQUIPMENT

Approved For Release 2011/02/07 : CIA-RDP82-00038R001400030001-4

I. INTRODUCTION

This instruction is to be adhered to, when checking the reference instruments on the dia 1869 test equipment panels during their service and storage within the guaranteed service life. The checks are performed together with the periodic maintenance operations in accordance with this instruction.

II. GENERAL

The tests are to be carried out under the following conditions:

- a) at an ambient air temper ware of $\pm 20^{\circ} \pm 5^{\circ}$ C;
- b) at an air pressure equal to the atmospheric pressure in the place of the test;
 - c) at a relative air humidity of 30 to 80 per cent;
- ficates which certify their serviceability.

III. PERIODIC MAINTENANCE OPERATIONS IN SERVICE AND STORAGE

The periodic maintenance operations consist in checking the test panels and are performed to determine their service-ability or possibility of their further storage and also to bring them into conformity with the specifications, if necessary.

The periodic maintenance operations are performed by the technicians of the using organization or the Mfr's plant.

Entries about the periodic maintenance operations performed are made in a special book by the engineer or chief technician of the organization.

The periodic maintenance operations are performed in the following manner and sequence.

After every 2 months:

- 1. Inspect all the plug connectors of the connecting cables for damage and corrosion, and remove dust and dirt from them. If corrosion signs are found on the pins, wash the pins with a brush dampened in alcohol and wipe with a cloth.
- 2. Remove the covers from the MM-I, M-I, M-5, M-X test panels, inspect the outer surfaces of the panels, instrument panels and plug connectors for damage, panels for proper attachment and shock mounting.

Wipe the outer surfaces with a cloth to remove dust and moisture.

If the plug connector contacts are dirty or affected by corrosion, wash and wipe them clean as described in para.1 of this instruction.

- 3. Check the knobs for attachment and tighten those loose.
- 4. If in operation of the W-I test panel on unsmooth movement of the "Signal" milliammeter pointer occur due to a

cirty potentiometer, remove the panel and wipe the potentiometer with a chamois cloth slightly dampered in rectified al-

- NOTE: a) Carry out the above described operations immediately after a defect is detected during the panel operation irrespective of the time the periodic maintenance operations are to be performed.
 - b) When installing the panel on shock mounts, seal
 : the panel with sealing compound by filling the sealing cup with the compound and place the cup under the panel attachment screw.
- 5. Check the panel electric instruments for accurate readings, taking into consideration that the test equipment for the 360 item is manufactured in the 10 lowing two versions:
 - 1) with reference instruments ensuring operation of the test equipment panels within the temperature range of -35° to +50°C(M5-2, 3-421, BH-46).
 - 2) with reference instruments ensuring operation of the test panels within the temperature range of -20° to +50°C (IM-70, IMC, IMI-70, BI-40).

Given below are permissible errors of the reference instruments for both versions of the test equipment. Therefore, when checking an instrument, refer to the tolerances for the type of the instrument whose error is to be checked.

oking the Reference Instruments of ANA-I Test Panel

- 1. Check the operation of the control surfaces position indicators on the AMA-I test panel as follows:
 - a) supply 26 V.D.C. to the 43/12(-)-43/13(+) pins;
 - b) set the "PANEL POWER SUPPLY" switch to the "BOARD CHECK";
- c) supply 26 V.D.C. viu a 20 kohmsresistor to the 15-14, 15-17, 13-19 pins of plug connector Ng.43 in turn with the polarity indicated in table No.1.

In this case the indicator pointers should move to the

Table No.1.

	AND THE PARTY OF T					
3	applied v	oltage polarity	Indicator	Direction of indi- cator pointer; def- lection		
-	15	14	"Tirection"	to the right		
***	16	17	"Pakoh" . "	to the right		
	18	19	"Bank"	to the right		
	1	1		The state of the s		

Change the polarity of the supplied voltage; in this case the indicator pointers should move to the left.

2. Check the reading error of the penel power supply voltmeter by connecting to the 43/12-43/10 pins a d.c. reference voltmeter (0.5 degree of precision with the scale graduated from 0 to 30 V).

Difference in the readings of the two voltmeters should not exceed:

- 0.9 V for the M5-2 voltmeter,
- 0.6 V for the Park voltmeter.

For this purpose connect a d.c. reference milliammeter [U.5] degree of precision with a 4-0-1 ma scale to the 43/4-43/2 pins. Perform the check with the "PANEL POWER SUPPLY" switch in the "BOARD CHECK" position and the E4 and K2 buttons pressed. Turning the knobs of the signal preset units to both sides, compare the readings of the reference milliammeter and the control signal incicators at the scale joints 0; U.2; 0.4; 0.6; 0.8; 1. Difference in their readings, should not exceed:

0.04 mA for the IEIC milliammeter,
0.06 mA for the M5-2 milliammeter.

Checking the Reference Instruments of HER Test Panel

Test the control surface position indicators for proper functioning.

Supply 26 volts via a 20 kohms resister in turn to the 14-15, 16-17, 18-19 pins of plug connector No.36 with the polarity indicated in table No.2, In this case the indicator pointers should move to the right.

Table No.2

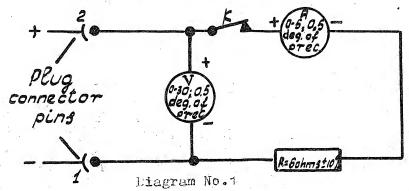
		Don't Andry allowing states where these en of built street grids of teacher and your effects the	water my cate was seen and provide the seen of the seen and the seen and
Indicator	Polarity of volume to pins of plug	Direction of indicator pointer deflec-	
	+	man form man or state or a total state of the state of th	• tion
"Direction"	15	14	to the right
"Pitch"	16	17	to the right
"Bank"	18	19	to the right

7

change the supplied voltage polarity; this done, the indi-

Checking the Reference Instruments of INI-I mest

- 1. To check the supply voltmeter reading error, proceed follows:
- a) Supply +26 volts to the "+" terminal, and -26 wolts the "-" terminal of the panel;
- b) connect a reference voltmeter (0.5 degree of precision) and ammeter (0.5 deg. of precision) to the 1-2 sockets of the plug connector according to the following diagram:



- c) switch on the "FANEL POTER SUPPLY" switch; in this case the pointers of all the voltmeters and ammeters should move to the right, and the difference in their readings should not exceed:
 - 0.9 V for the M5-2 voltmeters
 - 0.6 V for the IM-70 voltmeters
 - 0.28 A for the M5-2 ammeters
 - 0.18A for the IM-70 ammeters.

NOTE: To take the voltmeter readings, open the ammeter circuit by the switch K.

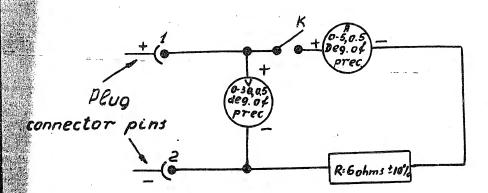
- 2. To check the "SIGNAL" milliammeter reading errors proceed as follows:
- the reference milliammeter of 0.5 degree of precision with a 0-3 scale and the resistor of 100 thms ±10%;
 - b) set the "F-NEL" switch to the E-4 position;
 - a) set the "POWER SULPLY switch to the "ON" position;
 - d) set the "WINLING" selector switch to the "1" position, and the "SIGNAL" switch to the "1ma" position. Turn the "SIGNAL" preset unit knob on the panel clockwise, and compare the readings (on the points, marked with figures) of the penel milliammeter with those of the reference milliammeter. Difference in their readings should not exceed 0.07 magnetic.
 - e) change the polarity of the reference milliammeter connected and make a similar check, with the "SIGNAL" preset unit knob turned counterclockwise;
 - f) make a similar check, with the "Signal" switch in the "1.5 mA" and "2.5 mA" positions.

"Signal" milliammeter and the reference milliammeter should not differ in more than 0.09 mA and 0.14 m. respectively.

meter of IM-70 type has a "3-0-3" mascale, the check is performed in a similar manner difference between the readings of the milliammeters in this case must not exceed 0.11 ma.

Checking the Reference Instruments of MI-5 Test Fanel

- 1. Check the power supply circuit voltmeter readings for error:
 - a) supply +26 volts to the "+26 V" terminal, and -26 volts to the "-26 V" terminal of the panel;
- b) connect a reference voltmeter (0.5 degree of precision, 0-30 v scale) and an ammeter (0.5 degree of precision, 0-5A scale) to the 1-2 sockets of the cable plug connector according to the following diagram:



Blagram No.1a

NOTE: If an astatic voltmeter (0.5 degree of precision)
is used, disconnect the latter, when checking the

- c) switch on the "PANEL POWER SUPPLY" switch, this done, the volumeter pointers should move to the right and difference between their readings should not exceed:
 - 7.0.9 V for W5-2 voltmeters,
 - 0.6 / for HE-70 voltmeters,
- d) close the ammeter circuit by the "F" switch: in this dise the ammeter cointers should move to the right and difference between the readings of both ammeters should not exceed:
 - 0.45 / for M5-2 symeters,
 - 0.1 % for Mb. O unmeters.
- Fig. 1. Theck the a.e. voltmuter one awarder for leading error proceeding as follows:
 - a) set the phase selector switch to the "t" position;
- et) connect a reference ammeter (0.5 degree of precision, 0-1. scale) and a reference voltmeter (0.5 degree of precision, 0-60 / scale) to the 5-4 nockets of the panel plug councetor and supply voltage according to the following diagram:

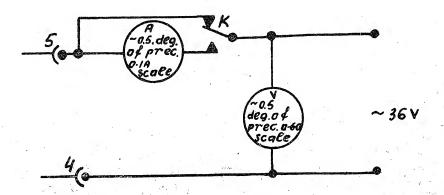


Diagram No.2.

(a) switch on the "10AD" switch on the panel: the p nel

In this case difference in the readings of the electric instruments should not exceed.

1.0 V for a BU-10 voltmeter,

0.03 ma for a 0-401 ammeter,

0:00 ma for a HFF-70 ammeter.

then taking the voltmeter readings, open the ammeter circuit by the "K" switch.